MONTHLY WEATHER REVIEW.

Editor: Prof. CLEVELAND ABBE.

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INTRODUCTION.

The MONTHLY WEATHER REVIEW for September, 1900, is based on reports from about 3,097 stations furnished by employees and voluntary observers, classified as follows: regular stations of the Weather Bureau, 158; West Indian service stations, 12; special river stations, 132; special rainfall stations, 48; voluntary observers of the Weather Bureau, 2,562; Army post hospital reports, 18; United States Life-Saving Service, 9; Southern Pacific Railway Company, 96; Canadian Meteorological Service, 32; Mexican Telegraph Service, 20; Mexican voluntary stations, 7; Mexican Telegraph Company, 3. International simultaneous observations are received from a few stations and used, together with trustworthy newspaper extracts and special reports.

Special acknowledgment is made of the hearty cooperation of Prof. R. F. Stupart, Director of the Meteorological Service of the Dominion of Canada; Mr. Curtis J. Lyons, Meteorologist to the Hawaiian Government Survey, Honolulu; Señor Manuel E. Pastrana, Director of the Central Meteorological and Magnetic Observatory of Mexico; Camilo A. Gonzales, Director-General of Mexican Telegraphs; Mr. Maxwell Hall, Government Meteorologist, Kingston, Jamaica; Capt. S. I. Kimball, Superintendent of the United States Life-Saving Service; and Commander Chapman C. Todd, Hydrographer, United States Navy.

The REVIEW is prepared under the general editorial supervision of Prof. Cleveland Abbe. The current number has been put through the press by Prof. Alfred J. Henry, the Editor being absent from the city.

Attention is called to the fact that the clocks and self-registers at regular Weather Bureau stations are all set to seventy-fifth meridian or eastern standard time, which is exactly five hours behind Greenwich time; as far as practicable, only this standard of time is used in the text of the REVIEW, since all Weather Bureau observations are required to be taken and recorded by it. The standards used by the public in the United States and Canada and by the voluntary observers are believed to conform generally to the modern international system of standard meridians, one hour apart, beginning with Greenwich. The Hawaiian standard meridian is 157° 30′ or 10^h 30^m west of Greenwich. Records of miscellaneous phenomena that are reported occasionally in other standards of time by voluntary observers or newspaper correspondents are sometimes corrected to agree with the eastern standard; otherwise, the local standard is mentioned.

FORECASTS AND WARNINGS.

By Prof. E. B. GARRIOTT, in charge of Forecast Division.

WEST INDIAN HURRICANE OF SEPTEMBER 1-12, 1900.

Measured by losses of life and property and the depression of the barometer at Galveston, Tex., the hurricane of September 8, 1900, was the severest storm that ever occurred in the United States. On Galveston Island upward of 6,000 human beings were drowned, or killed by falling buildings or flying debris, and property to the estimated value of $30,000,000 was destroyed. Enormous losses of life and property were also reported in the inland coast country. The barometer, which reached a verified minimum of 28.48 inches at Galveston, was lower by .10 inch than any reading previously made at a station of the Weather Bureau. The maximum wind velocities registered in this and other great storms are not comparable for the reason that the apparatus employed to record wind force can not, as a rule, withstand velocities which approach 100 miles an hour. At Galveston the greatest recorded wind velocity, for a five-minute period, was 84 miles an hour at 6:15 p. m., and 2 miles were registered at a rate of 100 miles an hour. At that time the anemometer was blown away. It was estimated that a velocity of at least 120 miles an hour was attained between 6:15 and 8 p. m. These velocities, both recorded and estimated, have been exceeded at other stations of the Weather Bureau. Excepting Mount Washington and Pikes Peak, the record for high winds in the United States was established at Cape Lookout, N. C., August 18, 1879, where a velocity of 138 miles an hour was registered before the anemometer was blown away, and the wind reached an estimated velocity of 165 miles an hour. During the tornado of May 27, 1896, at St. Louis, Mo., an extreme velocity of 120 miles an hour was recorded.

The devastation at Galveston was caused principally by a storm wave, which swept in from the Gulf in advance of the hurricane's vortex. This wave, 4 feet in depth, struck the already submerged island with almost irresistible force, and entirely destroyed the south, east, and west portions of the city for a distance of two to five blocks inland. In other parts of the city many houses were destroyed and none escaped injury.

There are a number of instances on record in which storm waves have caused appalling losses of life. In the sixteenth century the Lincolnshire coast of England was swept by a storm wave which caused a loss of thousands of human lives. On October 5, 1864, a storm wave, 16 feet deep, caused the loss of 45,000 lives on the Ganges delta. On October 31, 1876, a storm wave, 10 to 50 feet high, swept the eastern edge of the Ganges delta, destroying over 100,000 lives. Many of the most fatal tidal waves have been accompanied by earthquakes. The Lisbon earthquake of 1755 was accompanied by a wave which destroyed thousands of lives. Islands of the East and West Indies and some of the Japan islands have suffered severely from tidal waves which have attended earthquakes.

All low-lying coast districts which face the line of advance of severe storms are subject to overflow by storm waves of greater or less magnitude. The danger from these waves lies in the power of the rushing water, rather than in the depth of the overflow. During the last twenty-five years the Texas coast has been the scene of three storm-wave disasters. On September 15, 1875, Indianola was nearly destroyed by a wave from the Gulf, which caused a loss of 176 lives and over $1,000,000 worth of property. During August 19-20, 1886, Indianola was entirely destroyed. Many other instances might be enumerated to illustrate the destructive power of hurricanes and the attendant tidal and storm waves.

The record of the barometer at Galveston during the passage of the hurricane is shown by the following copy of the barograph tracing at that station. This tracing shows that Galveston was within the area of the storm's vortex for about one hour, and as the estimated progressive movement of the vortex at that point was about 8 miles an hour, the diameter of that part of the vortex which passed over Galveston was about 8 miles. It is evident from the shifts of the wind at Galveston and at the mouth of the Brazos River, which is 40 miles southwest of Galveston, that the center of the storm's vortex passed between Galveston and the mouth of the Brazos and moved northwestward some miles west of Galveston, and it follows that in the center of the vortex the barometer was lower, and that the vortex had a greater diameter, than was indicated at Galveston.

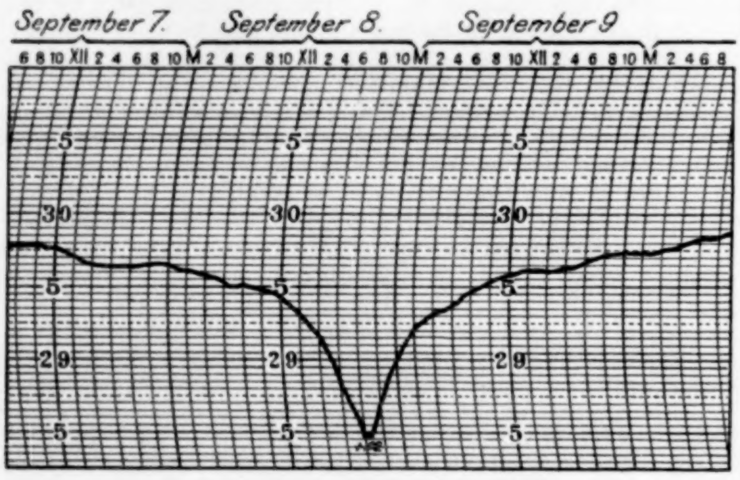

FIG. 1.—Barograph tracing.

The following description of the storm at Galveston has been prepared by Dr. I. M. Cline, official in charge of the Weather Bureau office at that place. In this description Dr. Cline presents an official report on the hurricane which embodies the general meteorological features recorded and observed by himself and his assistants, and recites the means employed in disseminating warnings. He also views the storm from the point of view of a resident of Galveston who underwent the most harrowing experiences:

SPECIAL REPORT ON THE GALVESTON HURRICANE OF SEPTEMBER 8, 1900.

The hurricane which visited Galveston Island on Saturday, September 8, 1900, was no doubt one of the most important meteorological events in the world's history. The ruin which it wrought beggars description, and conservative estimates place the loss of life at the appalling figure, 6,000.

A brief description of Galveston Island will not be out of place as introductory to the details of this disaster. It is a sand island about thirty miles in length and one and one-half to three miles in width. The course of the island is southwest to northeast, parallel with the southeast coast of the State. The City of Galveston is located on the east end of the island. To the northeast of Galveston is Bolivar Peninsula, a sand spit about twenty miles in length and varying in width from one-fourth of a mile to about three miles. Inside of Galveston Island and Bolivar Peninsula is Galveston Bay, a shallow body of water with an area of nearly five hundred square miles. The length of the bay along shore is about fifty miles and its greatest distance from the Gulf coast is about twenty-five miles. The greater portion of the bay lies due north of Galveston. That portion of the bay which separates the island west of Galveston from the mainland is very narrow, being only about two miles in width in places, and discharges into the Gulf of Mexico through San Louis Pass. The main bay discharges into the Gulf between the jetties; the south one being built out from the northeast end of Galveston Island and the north one from the most southerly point of Bolivar Peninsula. The channel between the jetties is twenty-seven to thirty feet in depth at different stages of the tide. There are channels in the harbor with a depth of thirty to thirty-five feet, and there is an area of nearly two thousand acres with an anchorage depth of eighteen feet or more. The mainland for several miles back from the bay is very low, in fact much of it is lower than Galveston Island, and it is so frequently overflowed by high tide that large areas present a marshy appearance. These are in brief the physical conditions of the territory devastated by the hurricane.

The usual signs which herald the approach of hurricanes were not present in this case. The brick-dust sky was not in evidence in the smallest degree. This feature, which has been distinctly observed in other storms that have occurred in this section, was carefully watched for, both on the evening of the 7th and the morning of the 8th. There were cirrus clouds moving from the southeast during the forenoon of the 7th, but by noon only alto-stratus from the northeast were observed. About the middle of the afternoon the clouds were divided between cirrus, alto-stratus, and cumulus, moving from the northeast. During the remainder of the 7th, strato-cumulus clouds prevailed, with a steady movement from the northeast. A heavy swell from the southeast made its appearance in the Gulf of Mexico during the afternoon of the 7th. The swell continued during the night without diminishing, and the tide rose to an unusual height when it is considered that the wind was from the north and northwest. About 5 a. m. of the 8th Mr. J. L. Cline, Observer, called me and stated that the tide was well up in the low parts of the city, and that we might be able to telegraph important information to Washington. He having been on duty until nearly midnight, was told to retire and I would look into the conditions. I drove to the Gulf, where I timed the swells, and then proceeded to the office and found that the barometer was only one-tenth of an inch lower than it was at the 8 p. m. observation of the 7th. I then returned to the Gulf, made more detailed observations of the tide and swells, and filed the following telegram addressed to the Central Office at Washington:

> Unusually heavy swells from the southeast, intervals one to five minutes, overflowing low places south portion of city three to four blocks from beach. Such high water with opposing winds never observed previously.

Broken stratus and strato-cumulus clouds predominated during the early forenoon of the 8th, with the blue sky visible here and there. Showery weather commenced at 8:45 a. m., but dense clouds and heavy rain were not in evidence until about noon, after which dense clouds with rain prevailed.

The wind during the forenoon of the 8th was generally north, but oscillated, at intervals of from five to ten minutes,

between northwest and northeast, and continued so up to 1 p. m. After 1 p. m. the wind was mostly northeast, although as late as 6:30 p. m. it would occasionally back to the northwest for one or two minutes at a time. The prevailing wind was from the northeast until 8:30 p. m., when it shifted to the east, continuing from this direction until about 10 p. m. After 10 p. m. the wind was from the southeast, and after about 11 p. m. the prevailing direction was from the south or southwest. The directions after 11 p. m. are from personal observations. A storm velocity was not attained until about 1 p. m., after which the wind increased steadily and reached a hurricane velocity about 5 p. m. The greatest velocity for five minutes was 84 miles per hour at 6:15 p. m., with two miles at the rate of 100 miles per hour. The anemometer blew away at this time, and it is estimated that prior to 8 p. m. the wind attained a velocity of at least 120 miles per hour. For a short time, about 8 p. m., just before the wind shifted to the east, there was a distinct lull, but when it came out from the east and southeast it appeared to come with greater fury than before. After shifting to the south at about 11 p. m. the wind steadily diminished in velocity, and at 8 a. m. on the morning of the 9th was blowing at the rate of 26 miles per hour from the south.

The barometer commenced falling during the afternoon of the 6th and continued falling steadily but slowly up to noon of the 8th, when it read 29.42 inches. The barometer fell rapidly from noon until 8:30 p. m. of the 8th, when it registered 28.48 inches, a fall of pressure of about one inch in eight and one-half hours. After 8:30 p. m. the barometer rose at the same rapid rate that had characterized the fall. The barograph trace sheet during this storm, from noon September 6 to noon September 10, is inclosed as fig. 1. On account of the rapid fall in pressure, Mr. John D. Blagden, Observer, took readings of the mercurial barometer as a check on the barograph, and his readings are as follows:

Time.	Readings.	Time.	Readings.
5:00 p. m.	29.05	6:40 p. m.	28.75
5:11 p. m.	29.00	6:48 p. m.	28.70
5:30 p. m.	28.95	7:15 p. m.	28.69
5:50 p. m.	28.90	7:40 p. m.	28.62
6:06 p. m.	28.86	8:00 p. m.	28.55
6:20 p. m.	28.82	8:10 p. m.	28.53

These readings confirm the low pressure shown by barograph and indicate the great intensity of the hurricane.

Mr. Blagden looked after the instruments during the hurricane in a heroic and commendable manner. He kept the wires of the self-registering apparatus intact as long as it was possible for him to reach the roof. The rain gage blew away about 6 p. m., and the thermometer shelter soon followed. All the instruments in the thermometer shelter were broken, except the thermograph which was found damaged, but has been put in working order.

Storm warnings were timely and received a wide distribution not only in Galveston but throughout the coast region. Warning messages were received from the Central Office at Washington on September 4, 5, 6, 7, and 8. The high tide on the morning of the 8th, with storm warnings flying, made it necessary to keep one man constantly at the telephone giving out information. Hundreds of people who could not reach us by telephone came to the Weather Bureau office seeking advice. I went down on Strand street and advised some wholesale commission merchants who had perishable goods on their floors to place them 3 feet above the floor. One gentleman has informed me that he carried out my instructions, but the wind blew his goods down. The public was warned, over the telephone and verbally, that the wind would go by the east to the south and that the worst was yet to come. People were advised to seek secure places for the night. As a result thousands of people who lived near the beach or in small houses moved their families into the center of the city and were thus saved. Those who lived in large strong buildings, a few blocks from the beach, one of whom was the writer of this report, thought that they could weather the wind and tide. Soon after 3 p. m. of the 8th conditions became so threatening that it was deemed essential that a special report be sent at once to Washington. Mr. J. L. Cline, Observer, took the instrumental readings while I drove first to the bay and then to the Gulf, and finding that half the streets of the city were under water added the following to the special observation at 3:30 p. m.: "Gulf rising, water covers streets of about half city." Having been on duty since 5 a. m., after giving this message to the observer, I went home to lunch. Mr. J. L. Cline went to the telegraph offices through water from two to four feet deep, and found that the telegraph wires had all gone down; he then returned to the office, and by inquiry learned that the long distance telephone had one wire still working to Houston, over which he gave the message to the Western Union telegraph office at Houston to be forwarded to the Central Office at Washington.

I reached home and found the water around my residence waist deep. I at once went to work assisting people, who were not securely located, into my residence, until forty or fifty persons were housed therein. About 6:30 p. m. Mr. J. L. Cline, who had left Mr. Blagden at the office to look after the instruments, reached my residence, where he found the water neck deep. He informed me that the barometer had fallen below 29.00 inches; that no further messages could be gotten off on account of all wires being down, and that he had advised everyone he could see to go to the center of the city; also, that he thought we had better make an attempt in that direction. At this time, however, the roofs of houses and timbers were flying through the streets as though they were paper, and it appeared suicidal to attempt a journey through the flying timbers. Many people were killed by flying timbers about this time while endeavoring to escape to town.

The water rose at a steady rate from 3 p. m. until about 7:30 p. m., when there was a sudden rise of about four feet in as many seconds. I was standing at my front door, which was partly open, watching the water, which was flowing with great rapidity from east to west. The water at this time was about eight inches deep in my residence, and the sudden rise of 4 feet brought it above my waist before I could change my position. The water had now reached a stage 10 feet above the ground at Rosenberg avenue (Twenty-fifth street) and Q street, where my residence stood. The ground was 5.2 feet elevation, which made the tide 15.2 feet. The tide rose the next hour, between 7:30 and 8:30 p. m., nearly five feet additional, making a total tide in that locality of about twenty feet. These observations were carefully taken and represent to within a few tenths of a foot the true conditions. Other personal observations in my vicinity confirm these estimates. The tide, however, on the bay or north side of the city did not obtain a height of more than 15 feet. It is possible that there was 5 feet of backwater on the Gulf side as a result of debris accumulating four to six blocks inland. The debris is piled eight to fifteen feet in height. By 8 p. m. a number of houses had drifted up and lodged to the east and southeast of my residence, and these with the force of the waves acted as a battering ram against which it was impossible for any building to stand for any length of time, and at 8:30 p. m. my residence went down with about fifty persons who had sought it for safety, and all but eighteen were hurled into eternity. Among the lost was my wife, who never rose above the water after the wreck of the building. I was nearly drowned and became unconscious, but recovered through being crushed by timbers and found myself clinging to my youngest child, who had gone down with myself and wife. Mr. J. L. Cline joined me five minutes later with my other two children, and with them

and a woman and child we picked up from the raging waters, we drifted for three hours, landing 300 yards from where we started. There were two hours that we did not see a house nor any person, and from the swell we inferred that we were drifting to sea, which, in view of the northeast wind then blowing, was more than probable. During the last hour that we were drifting, which was with southeast and south winds, the wreckage on which we were floating knocked several residences to pieces. When we landed about 11:30 p. m., by climbing over floating debris to a residence on Twenty-eighth street and Avenue P, the water had fallen 4 feet. It continued falling, and on the following morning the Gulf was nearly normal. While we were drifting we had to protect ourselves from the flying timbers by holding planks between us and the wind, and with this protection we were frequently knocked great distances. Many persons were killed on top of the drifting debris by flying timbers after they had escaped from their wrecked homes. In order to keep on the top of the floating masses of wrecked buildings one had to be constantly on the lookout and continually climbing from drift to drift. Hundreds of people had similar experiences.

Sunday, September 9, 1900, revealed one of the most horrible sights that ever a civilized people looked upon. About three thousand homes, nearly half the residence portion of Galveston, had been completely swept out of existence, and probably more than six thousand persons had passed from life to death during that dreadful night. The correct number of those who perished will probably never be known, for many entire families are missing. Where 20,000 people lived on the 8th not a house remained on the 9th, and who occupied the houses may, in many instances, never be known. On account of the pleasant Gulf breezes many strangers were residing temporarily near the beach, and the number of these that were lost can not yet be estimated. I inclose a chart, fig. 2, which shows, by shading, the area of total destruction. Two charts of this area have been drawn independently; one by Mr. A. G. Youens, inspector for the local board of underwriters, and the other by myself and Mr. J. L. Cline. The two charts agree in nearly all particulars, and it is believed that the chart inclosed represents the true conditions as nearly as it is possible to show them. That portion of the city west of Forty-fifth street was sparsely settled, but there were several splendid residences in the southern part of it. Many truck farmers and dairy men resided on the west end of the island, and it is estimated that half of these were lost, as but very few residences remain standing down the island. For two blocks, inside the shaded area, the damage amounts to at least fifty per cent of the property. There is not a house in Galveston that escaped injury, and there are houses totally wrecked in all parts of the city. All goods and supplies not over eight feet above floor were badly injured, and much was totally lost. The damage to buildings, personal, and other property in Galveston County is estimated at about thirty million dollars. The insurance inspector for Galveston states that there were 2,636 residences located prior to the hurricane in the area of total destruction, and he estimates 1,000 houses totally destroyed in other portions of the city, making a total of 3,636 houses totally destroyed. The value of these buildings alone is estimated at $5,500,000.

The grain elevators which were full of grain suffered the smallest damage. Ships have resumed loading and work is being rushed day and night. The railroad bridges across the bay were washed away, but one of these has been repaired and direct rail communication was established with the outside world within eleven days after the disaster. Repairs and extensions of wharfs are now being pushed forward with great rapidity. Notwithstanding the fact that the streets are not yet clean and dead bodies are being discovered daily among the drifted debris, the people appear to have confidence in the place and are determined to rebuild and reestablish themselves here. Galveston being one of the richest cities of its size in the United States, there is no question but that business will soon regain its normal condition and the city will grow and prosper as she did before the disaster. Cotton is now coming in by rail from different parts of the State and by barge from Houston. The wheels of commerce are already moving in a manner which gives assurance for the future. Improvements will be made stronger and more judiciously; for the past twenty-five years they have been made with the hurricane of 1875 in mind, but no one ever dreamed that the water would reach the height observed in the present case. The railroad bridges are to be built ten feet higher than they were before. The engineer of the Southern Pacific Company has informed me that they will construct their wharfs so that they will withstand even such a hurricane as the one we have just experienced.

I believe that a sea wall, which would have broken the swells, would have saved much loss of both life and property. I base this view upon observations which I have made in the extreme northeastern portion of the city, which is practically protected by the south jetty; this part of the city did not suffer more than half the damage that other similarly located districts, without protection, sustained.

From the officers of the U. S. Engineer tug *Anna*, I learn that the wind at the mouth of the Brazos River went from north to southwest by the way of west. This shows that the center of the hurricane was near Galveston, probably not more than 30 miles to the westward. The following towns have suffered great damage, both in the loss of life and property: Texas City, Dickinson, Lamarque, Hitchcock, Arcadia, Alvin, Manvel, Brazoria, Columbia, and Wharton. Other towns further inland have suffered, but not so seriously. The exact damage at these places can not be ascertained.

A list of those lost in Galveston, whose names have been ascertained up to the present time, contains 3,536 names.—*Isaac M. Cline, Local Forecast Official and Section Director.*

In tracing the hurricane from Galveston back over the Gulf of Mexico, reports from Gulf stations only are available during the early part of the 8th and on the 7th. On the 6th the Cromwell Line steamer *Louisiana* passed through the center of the hurricane in the middle-eastern part of the Gulf. The fact that this is the only vessel that is known to have encountered the storm in the Gulf of Mexico indicates that the Weather Bureau warnings and advices were generally observed at Gulf ports. It is apparent, from the following description by Captain Halsey, of the *Louisiana*, that the storm acquired hurricane intensity immediately after leaving the Florida coast, and it is equally evident that sailing vessels could scarcely escape serious injury or total loss in a storm of the character experienced by the *Louisiana*.

> We left New Orleans at 9:20 a. m. of September 5, and passed the bar at 5:22 p. m. that afternoon. The warning flag was up at Port Eads as we ran out. The wind was hard from the east-northeast, and the barometer was at 29.87. By 6 o'clock the next morning the barometer was at 29.60 and falling, and the wind was blowing a gale from the north-northeast and circling to the north. At 10 o'clock the wind was north and the barometer marked 29.25, and at 1 p. m. the barometer had fallen to the remarkable figure of 28.75 and we were in the storm center.
>
> I do not like to speak of anything outside of the log record, but I think the wind was blowing at the rate of more than 100 miles an hour. It went rapidly from the north to north-northeast, then to north-northwest, west, and south. We were about half way across the Gulf when the storm center passed us, and the sea which it raised was so severe that we hove to from 12 to 3 o'clock. The gale held until about 12 o'clock that night, when it began to moderate.

The most probable course of the hurricane from the 6th to 9th is shown on charts Nos. IX to XII of this REVIEW. We also give in tabular form the cloud data that were available

Amount, kind, and direction of clouds from September 6–9, 1900.

Stations.	September 6.						September 7.						September 8.						September 9.					
	A. M.			P. M.			A. M.			P. M.			A. M.			P. M.			A. M.			P. M.		
	Amount.	Kind.	Direction.	Amount.	Kind.	Direction.	Amount.	Kind.	Direction.	Amount.	Kind.	Direction.	Amount.	Kind.	Direction.	Amount.	Kind.	Direction.	Amount.	Kind.	Direction.	Amount.	Kind.	Direction.
Port of Spain, Trinidad	1	ci.s.	e.	1	ci.s.	e.	8	ci.s.	ne.	few	cu.	e.	few	ci.s.	se.	9	ci.s.	s.	2	ci.s.	calm.	few	ci.s.	s.
	few	a.s.	e.	1	cu.	e.	few	cu.	e.				1	cu.	e.	few	cu.	e.	1	cu.	se.	1	cu.	e.
	few	s.cu.	e.																					
Bridgetown, Barbados	4	cu.	e.	2	cu.	e.	6	ci.s.	ne.	2	cu.	e.	4	cu.	e.	1	cu.	e.	7	cu.	e.	6	s.cu.	se.
							1	cu.	e.															
Roseau, Dominica	1	s.cu.	ne.	9	ci.s.	calm.	few	ci.	calm.	2	ci.s.	calm.	few	ci.	calm.	2	cu.	e.	few	ci.	calm	5	s.cu.	e.
	2	cu.	se.	few	a.cu.	calm.	few	cu.	e.	3	cu.	e.	1	cu.	se.				2	cu.	e.	4	cu.n.	e.
				few	cu.	e.																		
Basseterre, St. Kitts	1	ci.s.	n.	9	a.s.	e.	4	ci.s.	n.	8	a.cu.	n.	3	ci.	n.	8	ci.s.	n.	1	ci.	n.	few	ci.	n.
	1	a.s.	s.	1	s.cu.	e.	1	a.cu.	nw.	1	cu.	e.	4	cu.	e.	1	cu.	e.	4	cu.	e.	4	cu.	ne.
	1	cu.	se.				1	cu.	se.															
San Juan, Porto Rico	1	a.s.	nw.	2	a.cu.	s.	1	a.cu.	nw.	6	a.s.	calm.	1	ci.	ne.	8	a.s.	n.	1	s.cu.	e.	5	s.cu.	e.
	1	s.cu.		5	s.cu.	se.	1	a.s.	w.	3	s.	s.	8	a.s.	n.									
	few	s.	s.				few	s.	se.				few	s.cu.	se.									
Santo Domingo, San. Dom.	few	ci.	n.	3	cu.	se.	1	ci.	n.	10	s.cu.	sw.	10	ci.s.	w.	1	ci.s.	calm.	2	ci.	w.	4	a.cu.	e.
	few	a.cu.	s.	1	s.cu.	se.	1	a.cu.	nw.							3	cu.	se.						
	3	s.cu.	s.				3	cu.	se.															
Kingston, Jamaica	10	n.	se.	10	s.cu.	se.	10	n.	e.	10	s.	se.	4	a.cu.	nw.	2	a.cu.	ne.	1	ci.cu.	w.	10	s.cu.	e.
													4	s.cu.	ne.	5	s.cu.	n.	4	a.cu.	w.			
																			few	s.cu.	ne.			
Grand Turk, Turks Island	3	ci.cu.	se.				4	ci.cu.	se.				5	a.s.	se.				5	a.s.	se.			
	3	cu.	se.				4	cu.	se.				5	cu.n.	se.				2	s.cu.	se.			
																			3	cu.	se.			
Santiago de Cuba, Cuba	10	cu.	se.	10	cu.	s.	10	n.	s.	10	cu.	nw.	10	n.	s.	10	n.	s.	3	a.s.	calm.	10	n.	s.
																			7	s.cu.	s.			
Puerto Principe, Cuba	5	a.s.	s.	10	s.	s.	10	s.	s.	10	s.cu.	s	5	a.s.	calm.	10	n.	nw.	3	a.s.	calm.	10	n.	ne.
	5	s.	s.										2	s.cu.	ne.				6	s.cu.	sw.			
																			1	s.	sw.			
Cienfuegos, Cuba	10	n.	s.	10	a.s.	se	few	a.cu.	w.	9	a.cu.	n.	9	a.s.	n.	10	s.cu.	ne.	few	s.cu.	calm	10	s.cu.	n.
							8	s.cu.	s.										9	a.s.	n.			
Havana, Cuba	6	ci.	w.	8	a.s.	sw.	2	ci.s.	n.	few	a.cu.	sw.	1	ci.	ne.	2	a.s.	calm.	1	ci.s.	n.	few	ci.	w.
	2	s.cu.	sw.	1	cu.n.	s.	2	a.cu.	s.	8	a.s.	sw.	6	a.cu.	w.	5	s.cu.	ne.	1	a.cu.	nw.	2	ci.s.	w.
							3	s.cu.	w.	few	cu.	s.	3	s.cu.	calm.				8	s.cu.	calm	2	cu.	e.
																						few	s.	e.
Key West, Fla	9	s.cu.	s.	9	s.	s.	10	n.	s.	3	s.cu.	s.	2	a.s.	sw.	1	a.s.	calm.	1	ci.s.	w.	5	s.cu.	e.
													3	s.cu.	sw.	7	s.cu.	ne.	4	s.cu.	e.			
Jupiter, Fla	10	n.	e.	10	s.	s.	8	s.	se.	10	s.	s.	8	s.cu.	se'	8	s.cu.	e.	7	s.cu.	se.	2	s.cu.	se.
Tampa, Fla	10	n.	calm.	9	s.	se.	1	a.cu.	se.	7	cu.	se.	9	s.cu.	e.	1	a.s.	calm.	7	ci.	n.	few	a.s.	calm.
							9	s.cu.	e.															
Jacksonville, Fla	3	ci.	s.	10	s.cu.	e.	1	ci.s.	calm.	3	a.s.	se.	2	ci.	w.	few	cu.	e.	2	cu.	e.	2	cu.	e.
	2	ci.cu.	s.				2	a.cu.	s.	1	a.cu.	se.	1	ci.s.	w.							4	s.cu.	e.
	5	s.cu.	e.				6	s.cu.	se.	6	s.cu.	se.	3	s.cu.	se.									
Savannah, Ga	4	cu.n.	e.	4	a.s.	sw.	3	ci.s.	n.	5	ci.s.	w.	2	ci.s.	nw.	2	cu.	se.	1	cu.	e.	few	cu.	se.
				6	s.cu	e.	4	cu.n.	e.	2	cu.	se.	2	cu.	e.									
Montgomery, Ala	1	ci.	se.	8	ci.s.	ne.	1	ci.	e.	6	ci.s.	s.	10	s.cu.	se.	3	a.cu.	e.	2	cu.	se.	few	s.	calm.
				1	s.	calm.	few	cu.	se.	3	s.cu.	e.				6	s.cu.	se.						
Mobile, Ala	5	ci.s.	ne.	4	a.s.	ne.	10	s.cu.	e.	1	ci.	se.	3	ci.	s.	2	ci.cu.	s.	2	ci.	calm.	1	ci.	w.
	2	a.s.	ne.	5	a.cu.	ne.				4	a.s.	e.	5	cu.	e.	8	s.cu.	se.	1	ci.cu.	calm.	1	s.cu.	s.
										1	a.cu.	e.							4	s.cu.	se.			
										1	s.cu.	e.												
New Orleans, La	4	ci.s.	e.	9	a.s.	sw.	2	ci.s.	se.	10	n.	ne.	10	s.cu.	se.	10	s.cu.	se.	1	ci.s.	calm.	10	s.cu.	s.
							6	s.cu.	ne.										2	s.cu.	se.			
Vicksburg, Miss	0	0	calm.	6	a.s.	ne.	3	ci.	se.	6	s.cu.	e.	5	ci.s.	e.	7	a.s.	e.	8	a.s.	e.	4	ci.s.	e.
				1	a.cu.	ne.							1	ci.cu	e.							1	s.cu.	s.
													2	s.cu.	se.									
Galveston, Tex	0	0	calm.	4	a.s.	ne.	6	ci.	se.	10	s.cu.	ne.	10	s.	n.	10	n.	ne.	10	s.	s.	5	ci.	se.
				4	s.cu.	n.	1	a.s.	se.													4	a.s.	se.
Palestine, Tex	2	cu.	e.	0	0	calm.	10	ci.	ne.	8	ci.	nw.	1	cu.	ne.	10	s.	ne.	10	n.	ne.	10	n.	se.

during the progress of the storm. The chief interest in the latter lies in the fact that there is an absence of suggestion or positive information in them as to the exact location of the center of the hurricane.

At New Orleans, La., advisory messages on the 4th and 5th were followed the afternoon of the 5th by an order to hoist the storm warning. During the 6th many inquiries were made at that office by owners and masters of outward-bound vessels, and in each case the advices were to delay departures until after the passage of the storm. The effects of the storm began to be felt at New Orleans the morning of the 7th, and a wind velocity of 56 miles an hour was recorded at Port Eads at that time. At New Orleans the Shell Road to West End was rendered impassable by the rising waters of the canal, and nearly all other canals and bayous were bank full with water backing from Lake Pontchartrain. The 8th was one of the windiest and stormiest September days ever experienced in New Orleans, and the maximum wind, 47 miles an hour, was within 1 mile of the highest wind ever recorded at that station in September. The local New Orleans press commented upon the storm as follows:

Times-Democrat, September 8, 1900:

Of yesterday's storm we had, as usual, ample notice. The Weather Bureau hung out storm warnings on Thursday, and as a consequence no vessels have put to sea of late. It was impossible to do more than this, but the people were put on their guard and waited to see at what point the storm would strike, for, like lightning, it seldom strikes twice in the same place.

Daily States:

Had not the blow been so well advertised by the Weather Bureau there might have been considerable damage done to shipping. As it was all the men of the sea were on their guard, and, so far as can be ascertained at this writing, there were only two vessels in this immediate vicinity lost, etc.

At Mobile and Pensacola the warnings were given an equally effective distribution, and they were universally heeded by shipmasters.

At Tampa, Fla., all shipping remained in harbor, except the schooner *Olive*, 135 tons, bound for Biloxi, Miss., which left while the warnings were flying. This vessel is reported missing. During the day and night of the 5th the gales which attended this storm scarcely attained hurricane force; they were sufficiently strong, however, to wreck a number of vessels on the keys and coasts of the southern Florida Peninsula. The captain of the steamship *Comal* felt the storm off Jupiter, Fla., and made no headway for twenty-four hours. He reports that sailing vessels could not stand the gale and were

driven ashore. Mr. A. J. Mitchell, Official in charge of the Weather Bureau station at Jacksonville, Fla., reports that—

The warnings were of great value to the large fleet of small sponge and fishing vessels on the lower coast, particularly from Cedar Keys south, and, so far as can be ascertained, 131 vessels, valued, with their outfits, at about $200,000, with crews numbering 235 men, delayed sailing on account of the display of the warnings.

During September 4 the influence of the storm extended over Cuba and the northwest Caribbean Sea. It had at that time developed but little force, but had caused torrential rains at many places. At Santiago de Cuba 12.58 inches of rain fell in twenty-four hours, of which amount 10.42 inches fell from noon to 8 p. m. of the 3d. During the first three days of the month the disturbance possessed but slight intensity, and is traced to the vicinity of the Windward Islands, where there was evidence of its development on the last day of August.

Returning to a consideration of the storm from the time its vortex passed Galveston, we find that, according to the custom of storms of this class, it experienced a rapid loss of energy after it had passed inland from the coast. Moving northward during the 9th and 10th as a disturbance of small strength, the center reached Iowa on the morning of the 11th, where it manifested considerable energy. During the ensuing twenty-four hours the storm passed eastward over the Great Lakes, attended by gales of unusual violence. Along this part of the storm's track ample warnings had also been sent, and a general observance of the warnings by the shipping interests reduced to a minimum the damage it caused in the Lake region. On the morning of the 12th, when the storm was central in the St. Lawrence Valley, a special bulletin issued by the Chief of the Weather Bureau at Washington contained the following:

There is little doubt that severe and dangerous gales will be encountered to-night and to-morrow over the Banks of Newfoundland and along the west part of the trans-Atlantic steamship routes.

Reports of incoming vessels show that unusually severe and especially destructive gales prevailed over and near the Grand Banks during the period specified.

The widespread interest which has been taken in this storm and in the work of the Weather Bureau in determining and forecasting its position, character, and course is indicated by the following press comments, which have been selected from a great number of articles of a like character which have been published by representative newspapers of the United States.

Editorial from the New York Evening Sun, September 20, 1900:

Meteorology is so complete a science that it can usually be depended on to give warning of the approach of dangerous storms. The value of the Weather Bureau's forecasts of what was destined to happen at Galveston can not be overestimated. According to Texas papers the Government indications did not leave that city or any part of the adjoining coast in ignorance of the prospective magnitude or violence of the storm. The people of Galveston read in the papers at their breakfast tables on Saturday that they were directly in the path of the disturbance, which had been working westward over the Gulf for nearly two days. The danger was upon them at that very hour, for the first burst of the gale struck the city between 8 and 9 o'clock a. m. Dr. Cline, the chief of the local weather station, was then at his office. From that hour until 3 o'clock in the afternoon he kept a man at the telephone, who called up every town and hamlet and all country residents within reach, informing them that there were signs of an inundation, and answered hundreds of calls for reports from the city and country, by which the news was spread on every hand.

The warnings which were sent out by Dr. Cline are said to have saved thousands of lives along the coast. The Texas papers show that in some towns and villages and at many plantations and farms the force of the wind and the rise of water were as necessarily fatal to life as at Galveston, but that the inhabitants and residents profited by their information to escape inland. The actual signs of the approach of the tempest were correctly read by Dr. Cline, and he was supplied with still further information from Washington. The difference between the heights of the barometer at Galveston and New Orleans and points north and west of the Texas city was the best prophecy of what might take place, and all through Saturday morning and until the weather station was closed the pressure showed that the worst was yet to come and would probably be some hours in arriving. The steady increase of the force of the wind and the gradual rise of the water on both sides of the city, the breakers on the Gulf beach rolling high, the rush of the sea into the bay, easily seen on the water front, and the backing up of the flood in the bay under the violent northeast gale, which soon made canals of the streets, left no doubt in the minds of cautious citizens that a catastrophe was imminent. Had the impression these facts created been more generally extended by a proper use of the information obtainable from the weather station, some thousands of lives which were lost might have been saved.

The idea may be dismissed as purely scientific, theoretical, and academic by very many intelligent persons. But none, except a fatalist, or one who does not believe in the uses of modern science, can neglect the lesson of the warnings. It seems that perhaps the largest number of lives were lost as a result of a refusal to accept them. The oldest residents were not thrown into a panic even when the water had flooded the whole city. They remembered the height reached by the tide in the storm of 1875, and as most of them, having built their houses after that event so that the first floor was above the level of danger then, were dwelling in such residences or had friends who occupied them, they repaired to these refuges. But the water climbed above its old mark and the wind, reaching a maximum at times of 100 miles an hour, assisted it in destroying nearly all of the stoutest houses. Dr. Cline occupied such a building, and was confident that the water would not reach his first floor, but his home was utterly demolished. He spent all the late afternoon in carefully watching the advancing height of the water and he did not give up his hope that his place would withstand the storm until the 1875 water mark was passed. In that last hour he waved warnings from his porch to his neighbors, telling them to fly to higher ground. Some could heed his warnings, but by far the most of the people were caught in the same way that he was.

Other proof of the value of the Weather Bureau's warnings is not wanting. Thousands of persons dwelling along the beach and east and west of Galveston fled to places of safety in spite of the fact that many persons far inland were drowned. Almost all of them had news from the weather station which told them of their danger. The beach residents fled, and the islanders were confident, like Dr. Cline and other residents of Galveston, that the storm could not bring the flood high enough to eat away the foundations of their houses. These people could nearly all have been alive at this moment. All this goes to show that the inhabitants of this country, especially those who are residents of districts liable to floods, should under no circumstances and at no time refuse to heed the warnings of the Weather Bureau. They would do well to observe and obey these with a degree of prudent caution equal to that displayed by the ship's master who takes note of the cautionary warnings at the Government's stations when it comes time to put to sea.

From the Boston Herald, September 17, 1900.

The excellent service rendered by the Weather Bureau during the recent storms, which carried havoc in their path, is deserving of recognition. It was not through any lack of attention on the part of the forecasters that the victims of the hurricane on the Texas coast were overtaken by such a terrible disaster. The weather office sent out its hurricane warnings both for the Atlantic and Gulf coasts, and when the storm turned from the north of Cuba westward the Bureau turned its attention to Texas, and on the morning of the 7th, nearly thirty-six hours before the disaster, warned the people of Galveston of its coming, and during that day extended its warnings all along the Texas coast, thus preventing vessels from leaving. Furthermore, the weather officials were remarkably successful in anticipating the coming of the hurricane, with less force, up toward the lakes, and thence in this direction. That such horrible disasters followed in the storm's path must be taken as showing either that the warnings were unheeded or that the havoc wrought was something inevitable.

From the Buffalo, N. Y., Courier of September 16, 1900:

The accuracy with which the coming and the course of the recent great storm were predicted, and the promptness with which warning was furnished to the mariners of the Gulf coast and the Great Lakes, afforded reason for noting the advanced efficiency of the United States Weather Bureau.

Editorial from the Marine Record, Ohio, September 13, 1900:

The Weather Bureau, also the officers in charge of lake stations,

gave full and ample warnings of Tuesday night's gale which swept over the lakes with such sad results to life and property. There can be no doubt but that this one warning alone has repaid the country for the outlay of the entire annual appropriation granted by Congress for the maintenance of the service. Too much credit can not be given to the Chief of the Weather Bureau and the officers in charge of lake stations for the energetic and well advised measures taken to warn vessels of the approach of the late gale and its probable severity.

Editorial from the Inter-Ocean, Chicago, Ill., September 14, 1900.

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Simple justice demands public recognition of the efficiency of the Chief of the Meteorological Bureau and his staff. They have demonstrated their usefulness in such manner as to set at rest all doubt with regard to the wisdom the Government has displayed in maintaining the weather service against all opposition and all ignorant prejudices.

The heated period which prevailed almost continuously over the eastern part of the United States during July and August was permanently broken by the tropical storm described herein, and advices to this effect were given in a special bulletin which was issued the morning of September 12, 1900.

From the 15th to the 18th a cool wave, which produced the first frost of the season, extended from the Northwestern States over the Lake region, and frost occurred in the Northwestern States from the 25th to the 27th. Warnings of these frosts were distributed over the districts visited. In the north Pacific coast States the occurrence of frost on the 19th, 24th, 25th, 27th, and 28th was, as a rule, predicted.

On the 23d and 24th snow fell in the mountains and hills about Salt Lake City, Utah. The Weather Bureau observer at Cheyenne, Wyo., reports that snow fell as far west as Evanston, and that a depth of 13 inches was measured at Sherman the morning of the 25th. On the 24th railroad contractors working on a big contract on Sherman Hill were specially informed by the Weather Bureau observer at Cheyenne of the approaching storm.

Toward the close of the month damage was caused by a rapid rise in the Colorado, Brazos, and Trinity rivers, Texas. Towns on the Colorado, south of Austin, were warned of the impending flood, and the inhabitants of the bottom lands of the Trinity were warned in time to escape. Interests along the Brazos River were also warned, on the 27th, that the rise would continue during the next few days and overflow low land.

CHICAGO FORECAST DISTRICT.

The principal meteorological feature was the passage of the Galveston storm across the lakes. On the morning of the 11th this storm was central over Iowa, and its characteristics were such that it was deemed advisable to at once send storm warnings to upper lake ports. The warnings were made especially strong because lake captains do not expect severe storms during the month of September, and stated that "the storm would be dangerous for practically all vessels to leave port."

The great force of the storm was not felt on Lake Superior, but it was not deemed advisable to take any chances on the direction of the storm's movement, and consequently all ports received equal warnings. Some of the lake stations reported higher wind velocities than any reported previously for several years, and the fact that few wrecks and casualties occurred was undoubtedly due to the advices issued by the Weather Bureau.

A storm of considerable energy moved eastward across the upper Lake region during the 15th and 16th. On the 15th warnings for this storm were ordered at all upper lake ports, except at Chicago and Milwaukee.

A general frost condition moved from the extreme northwest over the upper Mississippi Valley and the western Lake region from the 15th to the 18th. As this was the first frost of the season, the warnings were probably of great value. Frost warnings were also issued on the 25th, 26th, and 27th, in advance of frost which occurred in the Northwest and the northern Lake region.—*H. J. Cox, Professor of Meteorology.*

SAN FRANCISCO FORECAST DISTRICT.

No special forecasts or warnings were issued during the month.—*G. H. Willson, Local Forecast Official.*

PORTLAND, OREG., FORECAST DISTRICT.

The only storm during the month attended by high winds passed over the northern portion of the district on the 22d.

The storm struck the Gulf of Georgia with great violence and several small steamboats were capsized and sunk and their occupants were undoubtedly drowned. A dispatch from Tacoma says: "Steamboat men all say that the storm last night was the worst for many years, and the little damage done to shipping was due to danger warnings being displayed foretelling the storm." Frosts occurred on the 19th, 24th, 25th, 27th, and 28th, which were generally forecast.—*A. B. Wollaber, Acting Forecast Official.*

HAVANA, CUBA, FORECAST DISTRICT.

Stations in Cuba, Jamaica, Haiti, Turks Island, Santo Domingo, and Porto Rico and shipping interests were fully informed of the location, character, and course of the tropical storm which moved westward over the Caribbean Sea during the first three days of September and crossed northward over the western central part of Cuba during the 4th. The storm was not severe in the West Indies although the rains were, in places, torrential. At Santiago, Cuba 24.34 inches of rain fell from 8 a. m. of the 3d to 8 p. m. of the 7th, of which amount 12.58 inches fell in the twenty-four hours ending 8 a. m. of the 4th.—*W. B. Stockman, Forecast Official.*

AREAS OF HIGH AND LOW PRESSURE.

During the month there were nine highs and nine lows with sufficiently definite progressive movement to admit of their being charted. (See Charts I and II.) A brief description of their movements and more prominent characteristics follows herewith:

Highs.—It is particularly worthy of mention that none of the highs moved south of the thirty-ninth parallel except a minor offshoot of the one charted as No. VII. All except Nos. I, VI, VII, and the smaller section of No. IX originated in the Province of Alberta, N. W. T. Nos. III, IV, and IX moved almost directly eastward over Canada to the Atlantic Ocean. No. IX was joined over central Ontario by another section which had moved up from central Illinois. Nos. II and VIII also moved eastward over Canada, first taking a southeasterly course through the Dakotas, and thence easterly. No. I originated on the north Pacific coast, moved southeastward to Nebraska, and thence eastward to the southern New England coast, making on the way a detour through the Lake region. No. VI moved along the Pacific coast from northern California through Washington. No. VII originated in Wyoming, moved eastward to the upper Ohio Valley, then turned sharply northward to Ontario, again eastward to the Maine coast, and finally northeastward into the Atlantic by way of St. Johns, N. F.

During the earlier days of the month a high area also set-

tled off the middle and south Atlantic coasts, causing a continuance over the Atlantic States of the abnormally warm weather which had already prevailed for an almost unbroken period of over two months.

Movements of centers of areas of high and low pressure.

Number.	First observed.			Last observed.			Path.		Average velocities.	
	Date.	Lat. N.	Long. W.	Date.	Lat. N.	Long W.	Length.	Duration.	Daily.	Hourly.
High areas.		°	°		°	°	*Miles.*	*Days.*	*Miles.*	*Miles.*
I	1, a. m.	47	123	5, p. m.	42	70	2,950	4.5	656	27.3
II	4, p. m.	53	114	8, a. m.	45	64	2,475	3.5	707	29.5
III	7, a. m.	52	114	11, p. m.	46	60	2,575	4.5	572	23.8
IV	12, a. m.	52	114	16, a. m.	46	60	2,660	4.0	665	27.7
V	14, a. m.	54	114	21, a. m.	48	52	4,285	7.0	612	25.5
VI	19, p. m.	41	124	21, p. m.	48	122	520	2.0	260	10.8
VII	20, a. m.	48	109	26, a. m.	48	52	3,625	6.0	604	25.2
VIII	24, p. m.	53	114	29, a. m.	46	60	2,885	4.5	641	26.7
IX	29, a. m.	52	114	3, a m.*	48	52	3,000	4.0	750	31.2
	29, p m.	41	88				2,150	3.5	614	25.6
Sums							27,125	43.5	6,081	253.3
Mean of 10 paths							2,712		608	25.3
Mean of 43.5 days									624	26.0
Low areas.										
I	1, a. m.	15	67	12, p. m.	46	60	5,200	11.5	452	18.8
II	1, a. m.	44	103	2, a. m.	48	89	725	1.0	725	30.2
III	3, a. m.	46	118	7, a. m.	48	52	3,295	4.0	824	34.3
IV	10, a. m	21	82	17. a. m.	46	60	3,150	7.0	450	18.8
	13, a. m.	51	120				3,250	4.0	812	33.9
V	11. a. m.	54	114	15, a. m.	48	52	2,935	4.0	734	30.6
VI	14, a. m.	22	60	19, a. m.	48	52	2,575	5.0	515	21.5
VII	15, a. m.	44	116	24, a. m.	48	52	3,975	9.0	442	18.4
	17, a. m.	33	115				3,825	7.0	546	22.8
VIII	22, a. m.	51	120	25, p. m.	48	86	2,130	3.5	609	25.4
IX	26, p. m.	54	114	30, a. m.	49	88	1.220	3 5	349	14.5
Sums							32,280	59.5	6,458	269.2
Mean of 11 paths							2,935		587	24.5
Mean of 59.5 days									543	22.6

* October.

Lows.—With the exception of those of tropical origin, none of the low centers appeared south of the forty-second parallel except the lower section of No. VII, which was first noticed in southwestern Arizona. In fact they were for the most part limited to that portion of the country north of the forty-fifth parallel. Their mean direction of movement was almost due eastward or east-southeastward, and three of them, Nos. II, VIII, and IX, disappeared to the northeastward after leaving Lake Superior. No. II was a depression that had remained practically stationary over the extreme northwest since the morning of August 28, and it was not until the morning of September 1 that any progressive tendency developed. There was also a depression over the northwest from the evening of the 6th until the evening of the 10th, or until the tropical storm charted as No. I had turned eastward while leaving northern Kansas.

Of the three tropical storms—Nos. I, IV, and VI—No. I stands forth most prominently as the destructive hurricane of the early days of the month which created such terrible devastation and destruction at Galveston, Tex. A full history of this storm appears in another portion of this REVIEW. No. IV was a moderate disturbance, without destructive energy, which first appeared south of Cuba on the morning of the 10th. It reached the Louisiana coast by the evening of the 12th, and then recurved to the northeastward, reaching the southern New England coast on the morning of the 16th; it then moved northward to eastern Ontario, where it was joined by another depression of nearly equal intensity; it continued eastward in the track of the latter through Cape Breton Island into the Atlantic. No. VI was first reported by the captain of the steamship *Hungaria* in latitude 21°, longitude 60°, on the 13th. It moved slowly northward, apparently passing westward and close to the islands of Bermuda on the evening of the 17th. It moved more rapidly during the night of the 17th, and on the morning of the 18th was evidently central a short distance southeast of the southern New England coast, from whence it turned northeastward along the coast, passing off the Newfoundland coast on the morning of the 19th. This storm caused only moderately high winds on the New England and middle Atlantic coasts, but was evidently much more severe in its effects over its ocean path.—*H. C. Frankenfield, Forecast Official.*

RIVERS AND FLOODS.

Stages of water satisfactory to navigational interests prevailed during the month over the entire length of the Mississippi River. There was a fall of a few feet south of the mouth of the Ohio River, while to the northward there was a rise of a foot or more except between Cairo, Ill., and the mouth of the Missouri River, where there was but little change, the fall in the Missouri counterbalancing the rise which came down from the upper Mississippi. There was also a general fall of 1.5 to 3.5 feet in the Ohio River, the maximum fall occuring over the lower river. The Tennessee River fell considerably and navigation was suspended on its upper portion for the first few days of the second decade of the month, the river at Chattanooga, Tenn., reaching the lowest stages recorded for corresponding periods since 1883.

Nothing further of interest was noted except in Texas, where heavy rains from the 20th to the 23d, inclusive, and later in northwestern Texas, caused very rapid, and in many places, destructive floods over the Brazos, Trinity, and Colorado river districts. Along the Brazos River excellent opportunity was afforded to test the efficiency of the newly organized flood service. Warnings of danger-line stages at Waco, Tex., were issued on the 24th, and for that portion of the river between Waco and Hempstead, Tex., on the 27th. These warnings, which were issued from the Weather Bureau Office at Galveston, Tex., were accurate and timely, and the new service has been the subject of much favorable comment by those who are particularly interested. The greater portion of the damage done was unavoidable, and was limited chiefly to the loss of cotton and other field crops in the lowlands. In the vicinity of Fort Worth, Tex., where the rainfall was torrential, the Trinity River rose 20 feet during the night of the 20th. On the 27th a great volume of water came out of the West Fork of the Trinity, and on the 28th the main river at Fort Worth reached a height of at least 35 feet, and was more than one mile wide. One life was lost near Dallas, Tex., and the damage by overflow to crops, buildings, and railroads amounted to perhaps $100,000. Conditions along the Colorado River were very similar, and while no estimates of the damage have been received, it is very probable that the total amount of the loss will be fully as great, if not greater, than that along the Trinity River.

The highest and lowest water, mean stage, and monthly range at 129 river stations are given in Table XI. Hydrographs for typical points on seven principal rivers are shown on Chart V. The stations selected for charting are: Keokuk, St. Louis, Memphis, Vicksburg, and New Orleans, on the Mississippi; Cincinnati and Cairo, on the Ohio; Nashville, on the Cumberland; Johnsonville, on the Tennessee; Kansas City, on the Missouri; Little Rock, on the Arkansas; and Shreveport, on the Red.—*H. C. Frankenfield, Forecast Official.*

CLIMATE AND CROP SERVICE.

By JAMES BERRY, Chief of Climate and Crop Service Division.

The following extracts relating to the general weather conditions in the several States and Territories are taken from the monthly reports of the respective sections of the Climate and Crop Service. The name of the section director is given after each summary.

Rainfall is expressed in inches and temperature in degrees Fahrenheit.

Alabama.—The mean temperature was 77.8°, or 3.2° above normal; the highest was 100°, at Brewton on the 28th, and the lowest, 46°, at Scottsboro on the 18th. The average precipitation was 4.00, or 1.67 above normal; the greatest monthly amount, 8.55, occurred at Marion, and the least, 0.46, at Tuskegee.—*F. P. Chaffee.*

Arizona.—The mean temperature was 73.3°, or 3.2° below normal; the highest was 113°, at Blaisdell on the 5th, and the lowest, 19°, at Strawberry on the 28th. The average precipitation was 1.54, or 0.71 above normal; the greatest monthly amount, 6.54, occurred at Bisbee, while none fell at a number of stations.—*W. G. Burns.*

Arkansas.—The mean temperature was 78.0°, or 4.5° above normal; the highest was 104°, at Texarkana on the 17th, and the lowest, 49°, at Corning on the 17th and 30th and at Pond on the 30th. The average precipitation was 4.25, or 0.98 above normal; the greatest monthly amount, 9.17, occurred at Silversprings, and the least, 1.24, at Blanchard.—*E. B. Richards.*

California.—The mean temperature was 65.4°, or 3.1° below normal; the highest was 113°, at Salton on the 8th, and the lowest, 10°, at Bodie on the 17th and 25th. The average precipitation was 0.22, or 0.25 below normal; the greatest monthly amount, 3.43, occurred at Shasta, while none fell at 45 stations.—*G. H. Willson.*

Colorado.—The mean temperature was 57.8°, or 1.4° below normal; the highest was 104°, at Crook on the 9th, and the lowest, 9°, at Wagonwheel Gap on the 21st. The average precipitation was 1.19, or 0.22 above normal; the greatest monthly amount, 5.15, occurred at Vilas, and the least, trace, at Buenavista, Perry Park, Salida, and Wallet.—*F. H. Brandenburg.*

Florida.—The mean temperature was 80.4°, or 1.5° above normal; the highest was 99°, at McClenny on the 24th, and the lowest, 56°, at Wausau on the 19th and at McClenny on the 27th. The average precipitation was 4.75, or 2.53 below normal; the greatest monthly amount, 10.50, occurred at Fort Meade, and the least, 0.80, at Carrabelle.—*A. J. Mitchell.*

Georgia.—The mean temperature was 77.3°, or 3.0° above normal; the highest was 103°, at Bellville on the 28th, and the lowest, 41°, at Dahlonega on the 18th. The average precipitation was 3.06, or 0.50 below normal; the greatest monthly amount, 7.11, occurred at Tallapoosa, and the least, 0.50, at Hephzibah.—*J. B. Marbury.*

Idaho.—The mean temperature was 55.6°, or 1.1° below normal; the highest was 101°, at Hagerman on the 3d, and the lowest, 8°, at Chesterfield on the 27th. The average precipitation was 0.82, or 0.04 below normal; the greatest monthly amount, 3.34, occurred at St. Maries, while none fell at American Falls.—*S. M. Blandford.*

Illinois.—The mean temperature was 69.4°, or 2.2° above normal; the highest was 102°, at Cobden on the 8th, and the lowest, 30°, at Martinton on the 18th. The average precipitation was 3.41, or 0.23 above normal; the greatest monthly amount, 5.75, occurred at Loami, and the least, 1.50, at Strawn.—*M. E. Blystone.*

Indiana.—The mean temperature was 70.3°, or 4.1° above normal; the highest was 102°, at Salem on the 8th, and the lowest, 31°, at Winamac on the 18th. The average precipitation was 2.06, or 0.91 below normal; the greatest monthly amount, 5.63, occurred Washington, and the least, trace, at Valparaiso.—*C. F. R. Wappenhans.*

Iowa.—The mean temperature was 64.4°, or about normal; the highest was 99°, at Wapello on the 5th, and the lowest, 26°, at Sioux Center on the 29th. The average precipitation was 4.98, or about 2.00 above normal; the greatest monthly amount, 8.82, occurred at Spirit Lake, and the least, 2.48, at Leclaire.—*J. R. Sage, Director; G. M. Chappel, Assistant.*

Kansas.—The mean temperature was 70.4°, or 1.1° above normal; the highest was 108°, at Altoona on the 6th, and the lowest, 29°, at Coolidge on the 29th. The average precipitation was 6.37, or 3.20 above normal; the greatest monthly amount, 14.35, occurred at Chanute, and the least, 0.78, at Wallace.—*T. B. Jennings.*

Kentucky.—The mean temperature was 74.6°, or 3.8° above normal; the highest was 102°, at Maysville on the 10th, and the lowest, 35°, at Marrowbone on the 18th. The average precipitation was 2.25, or 0.35 below normal; the greatest monthly amount, 6.85, occurred at Marrowbone, and the least, 0.60, at Scott.—*H. B. Hersey.*

Louisiana.—The mean temperature was 81.3°, or 4.3° above normal; the highest was 104°, at Minden on the 17th, and the lowest, 58°, at Como on the 17th. The average precipitation was 2.80, or 1.09 below normal; the greatest monthly amount, 10.13, occurred at Port Eads, and the least, 0.20, at L'Argent.—*W. T. Blythe.*

Maryland and Delaware.—The mean temperature was 72.1°, or 4.6° above normal; the highest was 103°, at Hancock, Md., on the 11th, and the lowest, 29°, at Deerpark, Md., on the 19th. The average precipitation was 3.70, or 0.30 above normal; the greatest monthly amount, 8.23, occurred at Rockhall, Md., and the least, 0.40, at Deerpark, Md.—*Oliver L. Fassig.*

Michigan.—The mean temperature was 63.0°, or 3.1° above normal; the highest was 95°, at Traverse City on the 1st and at Mount Clemens on the 11th, and the lowest, 19°, at Humboldt on the 29th. The average precipitation was 3.23, or 0.08 below normal; the greatest monthly amount, 12.85, occurred at Calumet, and the least, 0.49, at Carsonville.—*C. F. Schneider.*

Minnesota.—The mean temperature was 58.2°, or about normal; the highest was 95°, at Milaca on the 1st, and the lowest, 24°, at Glencoe on the 15th and at Detroit and Milan on the 27th. The average precipitation was 6.55, or 3.57 above normal; the greatest monthly amount, 15.30, occurred at Hallock, and the least, 2.33, at Morris.—*T. S. Outram.*

Mississippi.—The mean temperature was 79.7°, or 5.2 above normal; the highest was 103°, at Brookhaven on the 17th, and the lowest, 50°, at Booneville on the 17th, and at Aberdeen, Batesville, and Corinth on the 18th. The average precipitation was 2.44, or 0.30 below normal; the greatest monthly amount, 8.51, occurred at Bay St. Louis, and the least, 0.63, at Agricultural College.—*W. S. Belden.*

Missouri.—The mean temperature was 70.9°, or 1.9° above normal; the highest was 100°, at Princeton on the 5th, and the lowest, 29°, at Bethany on the 17th. The average precipitation was 4.77, or 1.38 above normal; the greatest monthly amount, 10.57, occurred at Neosho, and the least, 1.18, at Edgehill.—*A. E. Hackett.*

Montana.—The mean temperature was 53.6°, or 1.8° below normal; the highest was 100°, at Ekalaka on the 3d, and the lowest, 8°, at Martinsdale on the 27th. The average precipitation was 1.60, or 0.42 above normal; the greatest monthly amount, 3.70, occurred at Columbia Falls, and the least, 0.16, at Chester—*E. J. Glass.*

Nebraska.—The mean temperature was 64.5°, or 0.8° above normal; the highest was 105°, at Geneva on the 5th, and the lowest, 23°, at Kennedy on the 26th. The average precipitation was 2.66, or 0.82 above normal; the greatest monthly amount, 10.45, occurred at Genoa, while none fell at several stations in the southwestern portion.—*G. A. Loveland.*

Nevada.—The mean temperature was 56.1°, or 5.4° below normal; the highest was 99°, at Los Vegas on the 6th, and the lowest, 17°, at Elko on the 28th. The average precipitation was 0.30, or about 0.05 below normal; the greatest monthly amount, 1.35, occurred at Ely, while none fell at many stations.—*J. H. Smith.*

New England.—The mean temperature was 62.6°, or 2.3° above normal; the highest was 99°, at Berlin Mills, N. H., on the 15th, and the lowest, 25°, at Flagstaff, Me., on the 18th and at Carmel, Me., on the 19th. The average precipitation was 2.98, or 1.30 below normal; the greatest monthly amount, 5.81, occurred at Newton, N. H., and the least, 1.00, at Woodstock, Vt.—*J. W. Smith.*

New Jersey.—The mean temperature was 69.9°, or 3.6° above normal; the highest was 98°, at Bridgeton on the 6th, and the lowest, 32°, at Layton on the 19th. The average precipitation was 2.86, or 0.82 below normal; the greatest monthly amount, 7.37, occurred at Billingsport Lighthouse, and the least, 1.09, at Cape May Courthouse.—*E. W. McGann.*

New Mexico.—The mean temperature was 64.3°, or 0.4° below normal; the highest was 100°, at Roswell on the 15th, and the lowest, 25°, at Winsors on the 20th and 29th. The average precipitation was 3.12, or 1.35 above normal; the greatest monthly amount, 6.53, occurred at Roswell, and the least, 0.63, at Olio.—*R. M. Hardinge.*

New York.—The mean temperature was 64.0°, or 3.8° above normal; the highest was 99°, at Wedgewood on the 11th, and the lowest, 27°, at Axton and New Lisbon on the 19th. The average precipitation was 2.27, or 1.42 below normal; the greatest monthly amount, 4.90, occurred at Canton, and the least, 0.41, at Penn Yan.—*R. G. Allen.*

North Carolina.—The mean temperature was 74.9°, or 4.5° above normal; the highest was 101°, at Littleton on the 10th and at Southern Pines on the 12th, and the lowest, 38°, at Linville on the 19th. The average precipitation was 2.45, or 1.90 below normal; the greatest monthly amount, 6.74, occurred at Horse Cove, and the least, 0.73, at Charlotte.—*C. F. von Herrmann.*

North Dakota.—The mean temperature was 54.6°, or 2.8° below normal; the highest was 98°, at Fort Yates on the 1st, and the lowest, 17°, at Ashley on the 26th and at Fort Yates on the 27th. The average precipitation was 4.95, or 3.98 above normal; the greatest monthly amount, 9.72, occurred at Minto, and the least, 1.41, at Ashley.—*B. H. Bronson.*

Ohio.—The mean temperature was 69.3°, or 3.7° above normal; the highest was 100°, at Hanging Rock on the 8th, 9th, and 10th, and at

New Richmond on the 8th; the lowest was 33°, at Orangeville on the 19th. The average precipitation was 1.76, or 0.88 below normal; the greatest monthly amount, 4.12, occurred at Plattsburg, and the least, 0.28, at Cincinnati.—*J. Warren Smith.*

Oklahoma and Indian Territories.—The mean temperature was 75.7°, or 1.4° above normal; the highest was 105°, at Waukomis on the 6th, and the lowest, 35°, at Wood on the 29th. The average precipitation was 6.68, or 4.07 above normal; the greatest monthly amount, 11.86, occurred at Tahlequah, and the least, 2.13, at Webbers Falls.—*C. M. Strong.*

Oregon.—The mean temperature was 58.2°, or 1.3° below normal; the highest was 97°, at Buckhorn on the 2d, and the lowest, 13°, at Riverside on the 26th. The average precipitation was 1.83, or nearly normal; the greatest monthly amount, 4.89, occurred at Bullrun, and the least, 0.24, at Burns.—*A. B. Wollaber.*

Pennsylvania.—The mean temperature was 68.4°, or 4.7° above normal; the highest was 100°, at Irwin on the 1st, at Derry Station on the 3d, and at Athens on the 11th, and the lowest, 27°, at Lawrenceville on the 18th and at Dushore on the 19th. The average precipitation was 1.77, or 1.52 below normal; the greatest monthly amount, 6.90, occurred at Swarthmore, and the least, 0.48, at Lock No. 4.—*L. M. Dey.*

South Carolina.—The mean temperature was 77.1°, or 2.9° above normal; the highest was 100°, at Yorkville on the 12th, at Cheraw, Columbia, and Santuc on the 13th, and at Temperance on the 14th, and the lowest, 45°, at Holland and Walhalla on the 17th. The average precipitation was 2.83, or 1.30 below normal; the greatest monthly amount, 6.15, occurred at Trial, and the least, 1.08, at Temperance.—*J. W. Bauer.*

South Dakota.—The mean temperature was 60.6°, or about 2.0° below normal; the highest was 101°, at Cherry Creek on the 4th, and the lowest, 20°, at Ipswich on the 17th and 27th. The average precipitation was 3.32, or about 1.95 above normal; the greatest monthly amount, 10.50, occurred at Elk Point, and the least, 0.46, at Academy.—*S. W. Glenn.*

Tennessee.—The mean temperature was 75.1°, or 4.4° above normal; the highest was 98°, at Oakhill on the 7th and 8th and at Maryville on the 11th and 12th, and the lowest, 34°, at Erasmus on the 18th. The average precipitation was 3.42, or 0.61 above normal; the greatest monthly amount, 7.33, occurred at Dyersburg, and the least, 1.07, at Tullahoma.—*H. C. Bate.*

Texas.—The mean temperature, determined by comparison of 44 stations distributed throughout the State, was 3.3° above normal. Nearly normal conditions prevailed over the Panhandle, while over the other portions of the State there was a general excess, ranging from 1.0° to 5.2°, with the greatest over east Texas and the eastern portion of north Texas. The highest was 105°, at Fort McIntosh on the 10th, and the lowest, 41°, at Amarillo on the 27th. The average precipitation, determined by comparison of 51 stations distributed throughout the State, was 2.60 above normal; there was a deficiency over the western portion of the coast district and the eastern portion of southwest Texas; nearly normal conditions prevailed along the extreme eastern border of the State, while over the other portions there was a general excess, ranging from about 1.00 to 12.71, with the greatest in the vicinity of Coleman; the greatest monthly amount, 15.82, occurred at Coleman, and the least, 0.05, at Fort McIntosh.—*I. M. Cline.*

Utah.—The mean temperature was 57.7°, or 4.1° below normal; the highest was 97°, at Hite on the 5th, and the lowest, 10°, at Loa on the 28th. The average precipitation was 1.28, or 0.42 above normal; the greatest monthly amount, 3.40, occurred at Tropic, and the least, 0.07, at Richfield..—*L. H. Murdoch.*

Virginia.—The mean temperature was 73.2°, or 3.8° above normal; the highest was 104°, at Buckingham and Fontella on the 9th, and the lowest, 37°, at Dale Enterprise on the 15th and at Meadowdale on the 19th. The average precipitation was 3.76, or 0.97 above normal; the greatest monthly amount, 8.05, occurred at Birdsnest, and the least, 1.20, at Columbia.—*E. A. Evans.*

Washington.—The mean temperature was 57.2°, or 0.5° below normal; the highest was 97°, at Lyle on the 12th, and the lowest, 20°, at Centerville on the 26th. The average precipitation was 1.52, or 0.34 below normal; the greatest monthly amount, 3.05, occurred at Granite Falls, and the least, 0.08, at Sprague.—*G. N. Salisbury.*

West Virginia.—The mean temperature was 71.1°, or 4.4° above normal; the highest was 100°, at Burlington on the 10th and at Romney on the 11th, and the lowest, 35°, at Dayton on the 18th and at Philippi on the 19th. The average precipitation was 1.92, or 1.03 below normal; the greatest monthly amount, 5.50, occurred at Princeton, and the least, 0.34, at New Martinsville.—*E. C. Vose.*

Wisconsin.—The mean temperature was 61.1°, or 1.2° above normal; the highest was 97°, at Prairie du Chien on the 6th, and the lowest, 28°, at Medford on the 17th, at Hillsboro on the 18th, and at Hayward and Knapp on the 27th. The average precipitation was 5.20, or 2.00 above normal; the greatest monthly amount, 9.46, occurred at Knapp, and the least, 1.51, at Oshkosh.—*W. M. Wilson.*

Wyoming.—The mean temperature was 54.7°, or 1.8° below normal; the highest was 98°, at Bittercreek on the 7th, and the lowest, 10°, at Daniel on the 18th. The average precipitation was 1.09, or 0.23 below normal; the greatest monthly amount, 2.19, occurred at Cheyenne, and the least, 0.20, at Bittercreek.—*W. S. Palmer.*

SPECIAL CONTRIBUTIONS.

THUNDERSTORMS AT ANTIGUA, W. I.

By W. H. ALEXANDER, Observer Weather Bureau, dated September 25, 1900.

Coincident with the passage of a weak cyclonic disturbance over or near the Leeward Islands during the last days of August, 1900, there occurred a number of thunderstorms. At St. Kitts thunderstorms occurred on the nights of August 30 and 31 and September 1. These storms, however, were very mild as compared with the one at Antigua on the night of August 30, which appears to have been of such unusual and marked severity as to merit special attention. By request Mr. Francis Watts, government analyst and agricultural chemist for the Leeward Islands, has kindly furnished the following data relative to the preceding meteorological conditions and attendant incidents.

The regular observations made at the government laboratory at St. Johns at 9 a. m. and 3 p. m., local time, were as follows, viz:

Time.	Pressure reduced to sea level.*	Temperature.					Wind.		Precipitation.	Clouds.	
		Dry.	Wet.	Dew-point.	Maximum.	Minimum.	Direction.	Velocity.		Amount.	Kind.
9 a. m.	29.960	81	78	75.0	86	77	ne.	2	0.00	7	ci. cu.
3 p. m.	29.876	85	80	75.9	......	....	n.	3	2.50	8	ci. cu.

*The original does not say reduced to standard gravity, but it is assumed that this correction, —0.06 inch, has been applied.—C. A.

Special readings of the barometer were made as follows, viz: 11:50 a. m., 29.942; 12:50 p. m., 29.913; 2:05 p. m., 29.881; and 3:25 p. m., 29.840. Changes in the wind direction were noted as follows, viz: At noon, north-northwest; at 3 p. m., north; at 6 p. m., west; and at 8 p. m., southwest. The total wind movement was only 155 miles for the day, or an average of 6.5 miles per hour.

Mr. Watts writes:

During the whole period there was nothing more than a light breeze. About 10 p. m. a thunderstorm sprung up to the southwest and came up over the land, appearing to be most severe over the region southwest of St. Johns Harbor, and generally within a radius of 3 miles of St. Johns. It died away soon after midnight. While it lasted it was very severe; the lightning was brilliant and almost continuous, while the flashes were very quickly followed by loud peals of thunder. One house in town was struck, and the gaff of the flagstaff at Goat Hill signal station was shattered by the lightning. The following is the rainfall in different parts of the island:

Place.	Direction from St. Johns.	Inches.
Skerretts	East..............	2.50
Thibous Jarvis	Northeast	2.50
Langfords	North	2.60
Yaptons	West	2.00
Blubber Valley......	South	1.80
The Ridge............	Southeast.........	1.22
Elliots	East-southeast...	1.45

The following account of this storm appeared in the Antigua Standard of September 1, 1900:

"A burnt child dreads the fire;" hence the alarm caused by the circulation on Thursday of an advisory message from the Weather Bureau intimating some atmospheric disturbance off Martinique. The lowering appearance of the heavens, anon tinged with a strange reddish yellow light, an ominous stillness and intense heat, and withal a

falling barometer, tended to increase the fear. In the early evening distant vivid flashes of lightning in the north and east presaged a thunderstorm, which gradually approached us, and proved to be one of the most severe we have for a long while, if ever in Antigua, experienced, lasting nearly all night. The flashes of electricity simultaneously with the roar of Heaven's artillery, and the driving rain on our iron covered roof were to us (who think less, perhaps, of the surrounding danger than of the majesty and power of the Great I Am) a phenomenon of grandeur beyond description. Not all of us love to view nature in her unwonted guise, but all of us recognize His restraining hand at work when we contemplate the dangers that surrounded us on Thursday night and yet realize that there is comparatively little damage to report.

The casualties so far as we have ascertained fortunately include no lives. The topmast of the flagstaff at Goat Hill signal station was splintered and thrown down. The telephone posts and lines in many localities were badly damaged, the wire in some places being perfectly fused and made as brittle as a lead pencil. The line to Hill House is cut in several places, one post burnt to the ground, leaving only a charred stump, another splintered into atoms, and two split from top to bottom. In St. Johns the residence of Mrs. Dew in Bishopgate and Popeshead streets was struck on the roof toward the south. The appearance, as we saw it, was as if several sledges, chisels, and hatchets had been used to reduce the rafters, shingles, and boards to the heaps of matchwood strewn about the bedroom in which they fell. * * * The fall of rain during the storm was pretty heavy. We have been favored with returns from twenty-eight stations, which give an average of 2.03 inches.

An eye witness residing near the telephone exchange says that it is impossible to describe how awfully beautiful was the sight of the electric fluid dancing in multicolored flames along the lines up and down High street. Residents at Yaptons felt themselves in imminent peril, as in that elevated locality it appeared as if balls of blue fire were all the time falling around the dwelling house; no damage there is reported, however.

THE STORM WAVES OF SOUTH CAROLINA AND TEXAS.

By Gen. E. P. Alexander, dated Georgetown, S. C., September 19, 1900.

The recent tragedy at Galveston has interested me deeply, not only for its human interest, but as throwing fresh light on the studies I made of the conditions of danger and safety in such gales in 1893 and 1894 in this vicinity, and I gladly accept the kind invitation to say a few words on the subject.

Clearly, our sea coasts are full, everywhere, of people living in what I called the zone of danger, and utterly oblivious of the precautions necessary to secure safety of life and property, even though they are generally simple and inexpensive.

Possibly Galveston may have experienced greater destructive forces than were developed in the South Carolina gales of 1893, but it would need the careful observations and measurements of experts to determine the fact. The maximum that we had here, at South Island, Georgetown, S. C., was a barometric depression in the center of less than two inches and a rate of fall never greater than about one one-hundredth of an inch a minute. This produced a wind velocity of probably one hundred and twenty miles an hour, as the maximum rate of short puffs, and a storm wave about eight and one-half feet above the level of ordinary high water. I mean by that, that much elevation of the sea level. Of course the actual billows reared their crests and sent their water much higher than that, and left flotsam which would mislead ordinary observers into believing that the sea had risen twelve or fifteen feet. But in none of the reliable official records which I could find in a search which I kept up for some years, covering all the principal lake and Atlantic ports, could I discover anywhere a higher figure than eight and one-half feet. I have, therefore, always taken that level above ordinary high water as limiting the zone of danger or the possible rise of the ocean level. As to the destructive power of the wind, my experience here was that it was never enough, of itself alone, to seriously injure any well built structure of ordinary size. By well built, I mean mortised and tenoned, well secured on firm foundations, and roofed with shingles. Such houses a century old nearly, and in exposed situations, are standing here to-day, and there are many examples, too, of even flimsy constructions being made to stand by temporary props if only the foundations were good.

It will be extremely interesting to have an expert's report upon what conditons determined safety, what wrought destruction at Galveston, and how things that were destroyed could have been saved. It seems to me that the Weather Bureau could render no greater service than to have such a study made very carefully. A diagram of the barometer, the wind, and the water, such as I made of the Carolina storms, would be very valuable.

There is also one other suggestion which I think the experiences of this storm demonstrates to be of such great importance that, in spite of every possible difficulty, it should be adopted and carried into effect as far as can be done. It is to organize a system of warnings by sound signals along the sea coast, not in the interior, for there the danger to life is small, but in the zone of danger. I suppose rocket bombs such as the rain-makers used would be cheapest and easiest to work to give the signal. Only one signal should be used, "caution;" two would cause confusion. That is one trouble now with the flag system; there is more of it than the average man will remember, but he can remember that the bombs mean caution. He can then fill his jugs with water, cover his cisterns and wells (lest the salt spray poison them), prop his house, drive his stock to high places, anchor down his farm bridges, tie up his boats, and prepare some refuge above the zone of wave action for his family.

I live and plant rice within this zone, and I have a very vivid appreciation of the value of every hour of warning, when it can be given, when the gale is sure to come. Warnings given when it is uncertain may do harm by discrediting those to come in the future.

THE WEATHER BUREAU OF JAPAN.

By F. B. Wright.

Mr. Frank Bennett Wright, who was until recently a "student assistant" at the Baltimore station of the Weather Bureau, is now traveling in the Orient with his father, the well-known geologist, and author of The Ice Age. He communicates from Tokio the following interesting note to the May report of the Maryland section of the Climate and Crop service:

In Maryland it is hard to realize that Japan is equipped with meteorological observatories which would do credit to any of our American cities. In respect to agriculture and forestry Japan far surpasses us. All the hillsides, where it is possible, are terraced with great care, and the small patches thus made produce at least two and often three crops a year, first a grain, such as wheat or barley, then rice, and lastly vegetables of some kind. Hillsides that are steep, or are composed of too poor soil for this, are set out with pine trees. There is no place, except Holland, where the land is in such a high state of cultivation. This has been the case for centuries, but the aid given the farmers by the weather bureau reports and forecasts is a blessing that has come with the recent Japanese awakening.

Besides the central office at Tokyo there are seventy substations which furnish data for the weather map and forecast issued every day at 2 p. m. This bulletin contains much the same facts as ours, but has three maps showing the weather changes during the preceding twenty-four hours.

At Mayebashi I visited the office, which is located just outside of the town, and was shown the apparatus and methods of work. In some respects it is better equipped than those of similar importance in the United States, but not as well in others. Nearly all the instruments are of German make.

The observers here are worked rather hard, for eye observations of the air temperature and the wet bulb, the height of the barometer, the direction of the wind, etc., are taken every four hours during both night and day. A record is also kept of the amount of ozone in the air and the temperature of the soil at one, two, and three feet.

One of the most interesting parts of the office to me was the seismograph room. Here in Japan, where earthquakes occur every few days, or oftener, the record of the seismograph is of great interest and importance, although shocks can not be forecast. This instrument

is set on a solid masonry base built up from the ground, so that the least movement will be transmitted. The slightest quiver of this base disturbs a cup of mercury, which makes an electrical connection that starts the large cylinder carrying the record paper, revolving slowly, and also makes three ink dots on the face of the clock, the first at the hour, the second at the minute and the third at the second. On the record sheet, which is lamp-blacked paper, rest two points, so hung that they are practically undisturbed by any trembling of the earth, and so are known as immovable points. One of these records the vertical and the other the lateral movements.

When an earthquake occurs the pens remain stationary, while the movements of the cylinder, which are the same as the ground at that place, make a tracing indicative of the magnitude and directions of the shock.

ON THE COLOR AND THE POLARIZATION OF BLUE SKY LIGHT.

By N. ERNEST DORSEY, Ph. D., dated Johns Hopkins University, September 19, 1900.

The color of the sky on a bright, clear day is familiar to all. In the zenith it is of a deep blue, but becomes more mixed with white as the point observed approaches the horizon where, when the sun is low, it may take on rich tints of red and orange. The exact character and intensity of the color depends directly upon the condition of the atmosphere and, with the transparency of the air, form the most important data for the predictions of the local weather prophet, that old, and often unschooled, man who has probably passed his entire life within the confines of a single county and by long experience has learned to foretell the weather twelve hours or more in advance with an accuracy which, considering the conditions, is truly remarkable. The professional meteorologist, on the other hand, has given the subject but scant attention, although the cause of the phenomenon has been discussed by philosophers and physicists ever since the belief in the possibility of at least a partial explanation of the physical world first entered the mind of man.

The story of the ideas held at various times to account for the color of the sky runs parallel with the history of science. Indeed, in science, as nowhere else, are we compelled to recognize that "history repeats itself." In tracing the elaboration of the theory of each and every phenomenon we find a résumé of the various steps by which the present position of science has been reached. In some cases the course is run in a few months or years; in others centuries are required, and in still others we may be so near the great unknowable that we may never be able to take a single step forward.

The theory of the color of the sky, as implied above, has been of slow growth. When this growth began no one can tell, probably in the mists that hide the beginnings of human knowledge. One of the first explanations that we find in scientific literature — almost barbarous in its crudity and unsupported by fact or theory—is the speculation of Leonardo da Vinci[1] that the blue of the sky is due to the mixing of the white sunlight, reflected from the upper layers of the air, with the intense blackness of space. This corresponds to the speculative stage of science, the age of the philosphers. Very closely related to the speculative, indeed we may be justified in considering it as a mere incident of this, is what we may call the inherent property stage. Under the dominion of this mental state the color of the sky was thought to be rendered intelligible by the statement that it is the inherent property of air,[2] or of unknown particles floating in the air,[3] to reflect blue and to transmit red and orange light. This is a true explanation *ignotum per ignotius*, and leaves those who accept it in a worse condition than they were before, for no one is so hopelessly ignorant as he who thinks he knows. In the next step analogy comes into play; this is a most valuable and effective tool for the scientist endowed with a vivid scientific imagination and with a keen, clear insight into nature, but for others a most dangerous weapon. In this case it is wielded by no less an intellect than that of Sir Isaac Newton. In his optical investigations, about 1675, he had been led to a study of the colors produced when light is reflected from thin films of transparent substances; these he found to depend upon the thickness of the film. When it is very thin it appears black; as the thickness gradually increases it becomes blue, then white, yellow, red, etc. This blue which first appears, and which may be seen surrounding the black spot on soap bubbles, Newton termed the "blue of the first order," and he thought it was of the same tint as the blue of the sky. Analogy now steps in and suggests that the color of the sky is due to the reflection of sunlight from transparent bodies of such a size that the reflected light is the blue of the first order. This was Newton's belief,[4] and he thought that the reflecting particles were small drops of water.

This is the first theory worthy of serious consideration, and was for a time generally accepted as correct. But no theory based on pure analogy can be regarded as final; it must first be subjected to the most severe analytical and experimental criticism of which we are capable. If it stands the test, well and good; if not, it must be rejected. In 1847 Clausius[5] subjected Newton's theory to a strict mathematicla analysis, and proved that, if the blue of the sky is the blue of the first order, resulting from the reflection of light from transparent bodies, these bodies must be in the form of thin plates or thin-walled, hollow spheres. They can not be solid drops or spheres, for then astronomical objects would never be sharply defined; a star would appear as large as the sun, and the sun, immensely larger; all celestial objects would appear as large discs of light, brightest at the center and fading out gradually toward the edges. For this reason Clausius, believing the blue to be that of the first order, held the opinion that the reflecting bodies were hollow spheres, or vesicles of water. The belief in the existence of so-called "vesicular vapor" did not originate with Clausius, but was a relic which had persisted from the speculative age[6] to this time in spite of its a priori improbability, and the natural opposition so caused. As the theory of vesicular vapor has now been completely discarded we need say no more about it; the real value of the work of Clausius lies in the proof that the light from the sky can not be due to the regular reflection of sunlight from small drops of water.

The experimental test was applied by Brücke,[7] who pointed out that the blue of the sky is radically different from the blue of the first order. Thus, the era of analogy began to give way to that of experimentation and analysis, which must go hand in hand; experimentation acts as guide, analysis is the engineer, bridging the crevasses which can not otherwise be crossed, and the prophet pointing out the logical results of each assumption. The object of this, the last stage yet reached in the progress of science, is to bring the new phenomena into line with the old, to show how they are the necessary consequences of other facts which are better known. Each fact is referred to some better known fact, and the best known facts are regarded as axioms, postulates, or unexplainable experimental data, or it may be as mere uncontradicted assumptions, according to the mental condition of the man pronouncing judgment upon them.

Before going farther it will be well to see what was now known in regard to the polarization of the sky, for from now on this and the theory of the color of the sky go along together. But right here we may mention that at various times during the orderly development of the theory of blue sky

[1] Traité de la Peinture, also quoted in Gehler's Wörterbuch, § Atmosphäre.

[2] Marriotte, Oeuvres I, p. 299. [3] Honoratus Fabri, Optical Essays.

[4] Optics, Book II.

[5] Crelle's Jour. für Math., 34, pp. 122-147, 1847; 36, pp. 185-215, 1848; Pogg. Ann., 72, pp. 294-314, 1847.

[6] Leibnitz, Opera Omnia, II. Part II, p. 82, edition of 1768.

[7] Pogg. Ann., 88, pp. 363-385, 1853.

light we find shooting up other ill-considered and short-lived suggestions for explaining the phenomenon; such as the suggestion that the color is purely subjective[8]; that it is due to ozone,[9] etc.

The polarization of light was discovered in the last part of the seventeenth century by Huygens, but remained an isolated phenomenon until early in the present century, when Malus (1808) discovered that light reflected from glass was polarized. This aroused renewed interest in the subject of polarized light and of the transmission of polarized light through crystals. While engaged in this work (1811) Arago[10] accidentally turned toward the sky a piece of mica which he was examining by means of a crystal of Iceland spar, when he immediately noticed that the two images formed by the spar became brightly colored with complementary tints. He found that the coloration varied in intensity with the orientation of the crystal and with the position of the point of sky observed. It was greatest at a point nearly 90° from the sun and decreased on each side of this circle. These observations proved that the sky light is itself polarized and that the maximum of polarization is approximately 90° from the sun. It was also found that in general the plane of polarization is that which includes the sun, the point observed, and the observer.

These facts were regarded as positive proof that the light from the sky is regularly reflected sunlight. But when light is reflected from a transparent body, the maximum of polarization occurs when the tangent of the angle of incidence is equal to the index of refraction of the body referred to the surrounding medium as unity. If the reflecting particles are water, the region of maximum polarization is about 74° from the sun; hence, the blue sky light can not be reflected from water, as Newton, Clausius, and others assumed. On the contrary, if this light is regularly reflected sunlight, the reflecting bodies must have an index of refraction which is nearly equal to unity; hence several suggested that it was due to the reflection of sunlight on its passage between layers of air of slightly different densities, or, perhaps, between the oxygen and nitrogen of the air, or, perhaps, from the ether to one or other of these gases. In all these cases the light would be exceedingly weak, and it has generally been admitted that at best this can account for but a small part of the observed phenomena.

So matters stood until Brücke[11] (1853) proved that the light scattered from a turbid medium is blue, and Tyndall[12] (1869) performed his beautiful experiments on this subject, in which he showed that when the particles causing the turbidity are exceedingly fine (too small to be seen with a microscope) the scattered light is not only a magnificent blue but is polarized in the plane of scattering, the amount of polarization is a maximum at an angle of 90° with the incident light, and the definition of objects seen through it is unimpaired by the turbidity. Here, for the first time, all the essential features of sky light were reproduced in the physical laboratory. This experiment of Tyndall's was at once recognized as giving the key to the problem. Lord Rayleigh[13] (1871–1899) undertook the analytical treatment of the subject and proved that when white light is transmitted through a cloud of particles, small in comparison with the cube of the shortest wave length present in the incident light, the light scattered laterally is polarized in the plane of scattering, the maximum of polarization is at 90° to the incident light, and the intensities of the components of the scattered light vary inversely as the fourth powers of their wave lengths; no account is taken of the light which has undergone more than a single scattering. All these facts have been shown to agree with the phenomena observed in the laboratory when light is passed through turbid media. Recently (1899) Lord Rayleigh[14] has shown that in this way about one-third of the total intensity of the light from the sky may be accounted for by the scattering produced by the molecules of oxygen and nitrogen in the air, entirely independent of the presence of dust, aqueous vapor, or other foreign matter.

We can not do better than to stop here for a few moments to consider Lord Rayleigh's physical explanation of the scattering produced by small particles.[15] On this theory light is propagated as transverse vibrations of the atoms or corpuscles of a medium that acts like an elastic solid; it is something like the waves that go along a rope when one end is shaken, only in the case of light we are dealing with no rope but with an infinite medium. When we speak of a beam of light being polarized we mean that all the vibrations in this beam take place in the same plane, and the plane of polarization may be defined as the plane passing through the direction of propagation of the light but perpendicularly to the direction of the vibrations, and therefore perpendicular to the plane of vibration. Now, imagine a beam of parallel light advancing through a homogeneous medium, say the free ether, in a vertical direction; there will be no light propagated except in this direction; there will be no scattered light. If, however, there exist in it particles optically denser than the ether, but small as compared with the wave length of light, then light will be scattered laterally by these. Indeed, the effect of these particles is to locally increase the effective inertia of the ether, whereas the rigidity remains unaltered; therefore, when a wave advancing through the medium reaches one of these particles, the displacement of the medium at this point is less than it would be were the particle absent. If we should apply to each particle a suitable force (which of course must be in the direction of the displacement and proportional to the difference of the densities of the particle and of the ether) we could restore the amplitude to the value it would have were the particle absent; under these conditions everything would go on as though there were no particle in the ether, and consequently there would be no scattered light, i. e., we should have neutralized the effect of the particle by the application of this force. Hence, on the other hand, we would have the same scattered light if the particle were absent and we should apply to this portion of the ether this force reversed in direction, that is to say, each particle acts as a center of a certain harmonic force acting upon the surrounding ether. Such a force will send out a plane polarized wave, whose intensity is symmetrical about the direction of the force as axis; it is zero in the direction of the force, and a maximum in the plane perpendicular to this direction.

The exact effect of such a force has been investigated analytically by Stokes[16] and also by Lord Rayleigh[17]. The displacement in the wave sent out by it is

$$\xi = \frac{F \sin \alpha}{4 \pi b^2 D r} \cos \frac{2 \pi}{\lambda} (b t - r)$$

if the force is $F \cos \frac{2 \pi b t}{\lambda}$; where r is the distance from the center of force to the point where the displacement is measured; α isthe angle between the direction of the force and the line joining the point considered to the center of force or the mean position of the disturbing particle; b is the velocity of

[8] Muncke, quoted in Gehler's Wörterbuch, art. Atmosphäre; Nichols, Phil. Mag. (5), 8, pp. 425–433, 1879; and Proc. A. A. A. S. 34, p. 78, 1885.
[9] Hautefeuille et Chappuis, Comptes Rendus, 91, pp. 522–525, 1880.
[10] Astronomie Populaire, 2, pp. 99–102; Oeuvres, 7, pp. 394 and 430.
[11] Pogg. Ann., 88, pp. 363–385, 1853.
[12] Phil. Mag. (4), 37, pp. 384–394, 1869; (4), 38, pp. 156–158, 1869.
[13] Phil. Mag. (4), 41, pp. 107–120, 274-279, 447–454, 1871; (5), 12, pp. 81–101, 1881 (5), 47, pp. 375–384, 1999.
[14] Phil. Mag. (5), 47, pp. 375-384, 1899.
[15] Phil. Mag. (4), 41, pp. 107-120, 1871.
[16] Math. and Phys. Papers II, pp. 243–328.
[17] Phil. Mag. (4) 41, pp. 107–120, 1871.

light; D the density of the ether; λ the wave length of the light sent out by the force; and π is the ratio 3.1416.

If the displacement in the incident wave is $A \cos \frac{2\pi b t}{\lambda}$, the force we must apply to the particle to restore the displacement to its natural value is

$$T(D'-D)\, A \left(\frac{2\pi b}{\lambda}\right)^2 \cos \frac{2\pi b t}{\lambda},$$

where D' is the optical density of the particle and T is its volume; therefore,

$$\xi = A\,\frac{D'-D}{D}\,\frac{\pi\, T}{r\,\lambda^2} \sin\alpha \cos\frac{2\pi}{\lambda}(b t - r),$$

and the intensity of the scattered light is for each particle

$$A^2\left(\frac{D'-D}{D}\right)^2 \frac{\pi^2 T^2}{r^2 \lambda^4} \sin^2\alpha.$$

Since the particles are in motion the light scattered from different particles will have no definite phase relation; hence, to get the effect of a cloud of such particles we must add the intensities of the light sent out by each separate particle.

If the incident light is plane polarized, α will be a constant for any given direction from the incident beam, and the total intensity of the light scattered in this direction will be

$$A^2\left(\frac{D'-D}{D}\right)^2 \frac{\pi^2 \sin^2\alpha}{\lambda^4} \Sigma \frac{T^2}{r^2}.$$

If the incident light is unpolarized, the intensity of the light scattered at an angle β with the direction of the incident beam will be

$$A^2\left(\frac{D'-D}{D}\right)^2 \frac{\pi^2 (1+\cos^2\beta)}{\lambda^4} \Sigma \frac{T^2}{r^2},$$

where $\Sigma \frac{T^2}{r^2}$ denotes the sum of $\frac{T^2}{r^2}$ for all the scattering particles in the line of vision. In none of this have we taken account of the light that has undergone more than a single scattering. If we denote the mean of the square of $\frac{T}{r}$ by $\frac{T_1^2}{r_1^2}$ and let N denote the number of particles in the line of vision, we can write the expression for the intensity of scattered light in the form

$$A^2\left(\frac{D'-D}{D}\right)^2 \frac{\pi^2 (1+\cos^2\beta)}{\lambda^4} \frac{N\, T_1^2}{r_1^2}.$$

What are the assumptions we have made in this treatment? They are:

1. Every scattering particle is so small that when a wave of length λ passes through the medium containing it the force is the same at every point of the particle, i. e., that each particle is small as compared with the cube of the shortest wave length of the incident light.

2. The particles are so far apart that their effect upon the velocity of light through the medium is negligible; i. e., that the particles are far apart as compared with the longest wave length with which we are dealing.

In his discussion of Lord Rayleigh's equations, Crova[18] claims there is a third assumption, viz, that the number of particles in unit of volume must be sensibly the same for all sizes of particles. He says: "La formule $\frac{1}{\lambda^4}$ est basée sur l'hypothèse que le nombre N de corpuscules contenus dans l'unité de volume d'air est sensiblement le même pour toutes les dimensions de ceux-ci." Mascart[19] is of the same opinion. This is evidently wrong. The expression

$$A^2\left(\frac{D'-D}{D}\right)^2 \frac{\pi^2\, T^2 \sin^2\alpha}{r^2 \lambda^4}$$

applies to particles of *all* sizes, provided they are small in comparison with the cube of the shortest wave length. The light from a cloud of such particles is merely the sum of the light from the individual particles; the relative number of particles of various sizes does not enter into the consideration at all; indeed, the composition of the light is entirely independent of all consideration of the number and size of the particles other than as specified in the two assumptions we have named. Particles of a size intermediate between these small ones and those larger ones that reflect light regularly produce effects as yet unknown, and are not amenable to this analysis.

From Lord Rayleigh's expression for the intensity of the scattered light we may conclude, if the manifold or multiply scattered light may be neglected:

1. The scattered light is polarized in the plane of scattering and the amount of its polarization is $\frac{1}{1+\cos^2\beta}$, being a maximum (completely polarized) when the direction of scattering is perpendicular to the direction of propagation of the incident light.

2. The intensity of the scattered light varies $\frac{1}{\lambda^4}$ times the intensity of the incident light. Its color or wave length is independent of the direction of scattering.

3. The maximum intensity of the scattered light is in a direction almost coincident with that of the incident light and in the opposite direction, and the minimum is in the plane perpendicular to this.

4. The larger the particles (provided the assumptions above are fulfilled), the more intense is the scattered light.

As stated above, we know little, if anything, about the action of particles that are just too large for this treatment to apply, but in another of his papers[20] Lord Rayleigh has solved to the next approximation (on the electro-magnetic theory) the special case of spherical particles, and finds that the light scattered should vary as the inverse eighth power of the wave length. In the air there are surely some particles approximately fulfilling these conditions, and hence the sky should appear bluer than indicated by the simple theory we have just considered. But we have not yet bridged the gap between "very small" particles and those large enough to give regular reflection.

We have thus far neglected the multiply scattered light, but this increases in intensity as the square and higher powers of the number of particles per unit volume, while the once-scattered light increases as the first power only. Hence, for a cloud of particles the multiply scattered light may easily become appreciable. This again increases the proportion of the blue.

For all these reasons the color of the light from the sky should be expressed by the sum of a series of terms of powers of the reciprocal of the wave length; not by a single term, as is ordinarily attempted. Crova,[21] endeavoring to express the intensity by a single term of the form $\frac{k}{\lambda^n}$, found values of n varying from 2 to 6 under different conditions, the average being about 4, as Lord Rayleigh[22] and Captain Abney[23] had found. But in no case could n be determined so as to give more than a fair agreement. As we have seen, values of n higher than 4 are to be expected; the lower ones are to be accounted for by the lateral scattering caused by the particles between the observer and the source of the scattered light which reaches him, by the absorption of the short waves by

[18] Comptes Rendus, 112. pp. 1176-1179, 1891.

[19] Traité d'Optique, III, p. 386, Sec. 731.

[20] Phil. Mag. (5), 12, pp. 81-101, 1881.

[21] Comptes Rendus, 112, pp. 1176-1179, 1246-1247, 1891.

[22] Phil. Mag. (4), 41, pp. 107-120, 1871.

[23] Phil. Trans., 178, part I, pp. 251-283, 1887; also Proc. Roy. Soc., 42, pp. 170-172, 1887.

interposed water vapor, and by the admixture of white light reflected from the larger particles.

The scattering of which we have been speaking is evidently different from what we ordinarily mean by reflection; the latter assumes that the reflecting surfaces have an area large as compared with λ^2; whereas, scattering assumes that the volume of the particle must be small as compared with λ^3.

Such is in outline the theory and the main facts in regard to the cause of blue sky light; but there are several secondary features, which must be now considered. The sky is bluer in the zenith than elsewhere, evidently because the path traversed by the scattered light is here the shortest, so that it suffers less admixture with white light and less absorption of blue light. Conversely it should be less blue near the horizon, and when the sun is low may take on a red or orange tint, as we know is the case. The light from the zenith is most intense when the sun is nearest it, as at true noon, and its blue is least pure at the hottest part of the day, on account of the maximum amount of large particles of dust and vapor constituting the haze existing at this time.

Arago discovered that there is a point, about 15° above the point diametrically opposite the sun (the antisolar point), where the polarization is zero;[24] between this and the horizon the polarization is horizontal. Babinet[25] discovered a similar point above the sun, and Brewster[26] found one below it. Between the neutral points discovered by Babinet and by Brewster the polarization is horizontal; below Brewster's point and above Babinet's it is vertical. For a little way on each side of the neutral points the plane of polarization is inclined at about 45° to the vertical. This seemed to indicate that superposed upon the polarization resulting from the scattering of direct sunlight is a horizontal polarization due to some secondary cause. It was soon suggested that the horizontal polarization is due to a secondary scattering of the light coming from the lower layers of the atmosphere, and this has generally, but not universally, been accepted as the most probable explanation. Other neutral points have been observed under rare conditions.

The positions of the neutral points, the amount of polarization, the position of the point of maximum polarization, as well as the color of the sky, are intimately connected with other meteorological phenomena, but as yet the observations have been so meager, made under such dissimilar conditions and by such various forms of apparatus, that it is nearly impossible to tell what is the true connection. Cornu[27] says:

D'une manière générale, la quantité de lumière polarisée est liée de la manière la plus directe avec l'état de l'atmosphère, à tel point que j'ai été amené à conclure que cette proportion était un coefficient caractéristique de l'état de l'atmosphère. La plus grande pureté du ciel correspond à la plus grande proportion de lumière polarisée, les cirrus et la brume diminuent cette proportion jusqu'à rendre nulle, lorsque le ciel devient couvert. * * * Ce qui est particulièrement intéressant, c'est que les moindres changements dans l'état atmosphérique sont décelés par le polarimètre avec une grande sensibilité, plusieures heures avant que les phénomènes précurseurs (variations barométriques, halos, phénomènes divers optique atmosphérique) aient commencé à signaler un changement.

Sous ce rapport, il serait utile de poursuivre méthodiquement ces observations, et de comparer les variations polarimétriques aux autres éléments caractéristiques de l'atmosphère. * * * La proportion de lumière polarisée augmente à mesure que le soleil descend sous l'horizon, jusqu'à un certain maximum, après lequel la polarisation disparait rapidement. La loi d'acroissement avec le temps de cette proportion est fort importante, car elle me parait devoir donner la répartition de la brume dans l'atmosphère suivant la verticale; en effet, si l'accroissement est rapide, c'est que les couches inférieures sont brumeuses et les couches supérieures transparentes, si l'accroissement est lent, l'atmosphère est plus homogène.

[Translation]

In a general way, the amount of polarized sky light is connected in so direct a manner with the condition of the atmosphere that I have been led to think that it is characteristic of the state of the atmosphere. The greatest clearness of the sky corresponds to the greatest amount of polarization; cirrus and fog decrease the amount, and even completely destroy the polarization when the sky is overcast. * * * What is particularly interesting, is that the least change in the state of the atmosphere is plainly shown by the polarimeter several hours before other precursory phenomena (barometric variation, halos, and various other optical phenomena) have begun to indicate a change.

Under these conditions it would be useful to carry out these observations in a methodical manner, and to compare the polarimetric variations with other elements characteristic of the atmospheric condition. * * * The amount of polarization increases as the sun sinks below the horizon until it reaches a certain maximum, after which the polarization rapidly disappears. The law of this increase of polarization with the time is very important, for it appears to me to give the vertical distribution of fog in the atmosphere; indeed, if the increase is rapid the lower layers are foggy and the upper ones transparent; if the increase is slow, the atmosphere is more homogeneous.

In short, the more fog or cloud there is present the less the amount of polarization and the less pure is the blue of the sky.

The most extensive series of observations are those of Rubenson[28] and of Brewster[29] on the polarization, and of Crova[30] and Abney[31] on the color of the light from the sky. The first limited himself to observations made in fairly clear weather, and the second directed his attention principally to the determination of the positions of the various neutral points. Rubenson and most other observers have laid special stress upon the intensity of the polarization at its maximum point in the vertical circle through the sun. This is undoubtedly the point where observations can be most easily taken, and those so obtained must be of great meteorological value, but the interpretation of them is rendered difficult by the variation in the length of the path of the scattered light at different times of the day. At sunrise and sunset the point observed is the zenith, and the path is a minimum; while at noon, if the observer be in the tropics, the point observed may be on the horizon, and the length of the path a maximum. For other positions on the surface of the earth the variation in length of path is less than this.

On the other hand, unless we observe a point of maximum polarization the observations will be vitiated by every error in determining the position, with respect to the sun, of the point observed. Though other objections may be urged, it has occurred to me that for meteorological prediction the most valuable data would be obtained from continuous observations of the amount of the polarization of the light from points of the sky on the horizon and 90° distant from the sun. These are points of maximum polarization; these observations will give a kind of integration of the atmospheric conditions over a large area, and the length of path being the same at all times the observations should all be comparable, except for the varying angle of illumination of the surface of the earth, which, unless the nature of the surface differs greatly in different directions, I think would hardly affect the results appreciably, except, perhaps, when the sun is near the horizon. No one, to my knowledge, has carried out such a series of observations, hence the suggestion is advanced with great hesitation.

Since the color of the sky is independent of the angular distance of the point observed from the sun, being a function of only the state of the atmosphere and the thickness of the stratum observed, there is but little choice in the altitude of the point where we make the color observations. But since the blue is a maximum in the zenith this is rather to be pre-

[24] Oeuvres, VII, p. 394.
[25] Pogg. Ann., 51, pp. 562-564, 1840.
[26] Pogg. Ann., 66, pp. 456-457, 1845.
[27] Limoges Meeting of French Assoc. Adv. Science, 1890, pp. 267-270.
[28] Nova Acta Reg. Soc. Upsala (4), 5, 1864, Mémoire sur la Polarisation, etc.
[29] Phil. Mag. (3), 31, pp. 444-454; (4), 30, pp. 118-129, 161-181; (4), 33, pp. 290-304, 346-360, 455-465.
[30] Ann. de Chim. et de Phys. (6), 20, pp. 480-504, 1890; (6), 25, pp. 534-567, 1892.
[31] Phil. Trans., 178, part 1, pp. 251-283, 1887.

ferred, for a slight error in the position of the point observed will here produce the least effect.

Whatever point or points are observed, the fact remains that careful observations on the color and the polarization of the light from the sky will give us data determining the amount and size of the particles floating in the air, be they dust or water, and, as any change in the state of the atmosphere will affect these quantities, such observations should be of ever increasing importance to meteorology. First, however, we must have a long series of observations taken at different places and under all conditions, with exact meteorological data obtained at the same time and place, together with a description of the nature of the surrounding country. When these have been obtained it should be not very difficult to find means of using future observations with great success.

The results so far obtained can be interpreted only in the most general manner, as above; the daily and hourly variations and the subsidiary phenomena have not as yet been satisfactorily interpreted, and until this is done an abstract of the suggested views might be misleading. For this reason it seems best to limit ourselves to this short note which is intended merely to call attention to this interesting subject and to present in a more or less readable manner the facts and theory of the color of the sky. Those who wish to add to our knowledge on this subject will consult the original papers. Résumés will be found in the following articles:

1. James D. Forbes, on The Colors of the Atmosphere, considered with reference to a previous paper On the Color of Steam under certain circumstances. Philosophical Magazine (3), 14, pp. 419–426, 1839, and (3), 15, pp. 25–37, 1839; also in Pogg. Ann., Erg. Bd. 1, pp. 49–78, 1842.

2. Sir David Brewster's Observations on the Polarization of the Atmosphere, made at St. Andrews in 1841, 1842, 1843, 1844, and 1845. Phil. Mag. (4), 30, pp. 161–181, 1865; also in Trans. Roy. Soc. of Edinburg, 23, pp. 211–240, 1894; and in Keith Johnston's Physical Atlas, London.

3. R. Rubenson's Mémoire sur la Polarisation de la Lumière Atmosphérique. Nova Acta Regiæ Societatis Scientiarum Upsaliensis (4), 5, Fasc. 1, 1864.

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MEXICAN CLIMATOLOGICAL DATA.

Through the kind cooperation of Señor Manuel E. Pastrana, Director of the Central Meteorologic-Magnetic Observatory the monthly summaries of Mexican data are now communicated in manuscript, in advance of their publication in the Boletin Mensual. An abstract, translated into English measures, is here given, in continuation of the similar tables published in the MONTHLY WEATHER REVIEW since 1896. The barometric means have not been reduced to standard gravity, but this correction will be given at some future date when the pressures are published on our Chart IV.

Mexican data for September, 1900.

Stations.	Altitude.	Mean barometer.	Temperature. Max.	Temperature. Min.	Temperature. Mean.	Relative humidity.	Precipitation.	Prevailing direction. Wind.	Prevailing direction. Cloud.
	Feet.	*Inch.*	°*F.*	°*F.*	°*F.*	%	*Inch.*		
Durango (Seminario)	6,243	24 07	87.8	50.0	64.4	60	4.30	ene.	se.
Leon (Guanajuato)	5,934	24.33	82.6	53.4	67.5	67	2.23	sse.	e.
Mazatlan	25	29.86	92.8	72.7	83.3	80	14.18	nw.	se.
Merida	50	29.99	95.0	78.8	81.5	80	1.50	ne.	e.
Mexico (Obs. Cent.)	7,472	23.08	77.0	50.9	62.8	68	2.51	n.	ne.
Morelia (Seminario)	6,401	23.99	78.8	51.8	63.9	80	3.22	e.	e.
Puebla (Col. Cat.)	7,112	23.37	77.0	51.8	65.7	81	8.09	e.	sw.
Saltillo (Col. S. Juan)	5,399	24.83	83.3	56.1	69.6	73	4.46	n.	s.

RECENT PAPERS BEARING ON METEOROLOGY.

W. F. R. PHILLIPS, in charge of Library, etc.

The subjoined list of titles has been selected from the contents of the periodicals and serials recently received in the library of the Weather Bureau. The titles selected are of papers or other communications bearing on meteorology or cognate branches of science. This is not a complete index of the meteorological contents of all the journals from which it has been compiled; it shows only the articles that appear to the compiler likely to be of particular interest in connection with the work of the Weather Bureau:

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Bornstein, R. Gewitterbeobachtungen bei einer Ballonfahrt. P. 377.
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Mac Dowall, —. Ueber die Frage einer 10 jährigen Wetterperiode. P. 381.
P, H. Ueber den Kugelblitz. P. 382.
Pernter, J. M., und Trabert, W. Untersuchungen über das schiessen. P. 385.
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Krammer, H. Hagelkörner von eigenthümlicher Form. P. 417.
Maier, M. Temperaturbeobachtungen bei der am 28 Mai 1900 stattgefundenen Sonnenfinsterniss. P. 417.
Rudolph, H. Die Entstehung der Sonnenflecken. P. 418.
— Klima der Schneekoppe. P. 419.
Bauernberger, H. Leuchtende Nachtwolken? P. 419.
Bornstein, R. Gibt es eine Beziehung zwischen Luftdruckvertheilung und Monddeklination? P. 420.
Taudin-Chabot, J. J. Drei Beobachtungen über die Plasticität des Eises. P. 425.
Taudin-Chabot, J. J. Grünstrahlung. P. 426.
— Grüner Strahl beim Venus-Untergang. P. 426.
Geitel, H. Eine Vorrichtung zur Demonstration von Luftwogen. P. 426.
— Aenderung des Erdmagnetismus mit der Höhe. P. 427.

OBSERVATIONS FOR LOCAL THUNDERSTORMS AT SKYLAND. PAGE COUNTY, VA., SEPTEMBER, 1900.

By Messrs. W. H. and H. S. CRAGIN.

September 1.—8 a. m., 70°; 3 p. m., 81°; 9 p. m., 70°. Fair and slightly warmer, with light east winds.

September 2.—8 a. m., 70°; 3 p. m., 78°; 8 p. m., 67°. Fair and not so warm; light east winds, becoming high at night.

September 3.—8 a. m., 67°; 1 p. m., 76°; 8 p. m., 70°. Partly cloudy, with light east winds, becoming northwest at night. There was a little rain early in the morning of the 4th.

September 4.—8 a. m., 64°; 1 p. m., 76°; 8 p. m., 67°. Fair, with fresh northwest winds.

September 5.—8 a. m., 69°; 1 p. m., 76°; 8 p. m., 71°. Generally fair, with fresh to light south winds.

September 6.—8 a. m., 67°; 3 p. m., 84°; 11 p. m., 71°. Fair and warmer; west winds.

September 7.—8 a. m., 70°; 2 p. m., 82°; 11 p. m., 69°. Partly cloudy; continued warm, with fresh east winds. Between 4 and 6 p. m. several light showers occurred in the Shenandoah Valley. The area of precipitation extended from a few miles to the north of the gap nearly to Riverton. There was practically no movement to the storm.

September 8.—8 a. m., 72°; 2 p. m., 81°; 11 p. m., 74°. Partly cloudy and warm; fresh east winds. Between 12 a. m. and 2 p. m. a general showery formation appeared to the west of here in the neighborhood of Newmarket Gap. The stormy formation disappeared without moving. Some little rain fell.

September 9.—8 a. m., 74°; 2 p. m., 82°; 8 p. m., 70°. Partly cloudy, continued warm; light south to east winds. Between 2 and 3 p. m. a light shower, with but little thunder, formed in the neighborhood of the gap, and moved east by northeast, crossing the ridge to the north of here—the extreme southern edge passing over camp a little after 3 p. m.

September 10.—8 a. m., 71°; 2 p. m., 83°; 1 p. m., 68°. Fair in morning; partly cloudy, with showers in afternoon. Between 5 and 6 p. m. a few showers occurred in the Shenandoah Valley. From 7 to 10 p. m. a little rain fell in camp.

September 11.—8 a. m., 74°; 2 p. m., 86°; 11 p. m., 73°. Fair, with fresh south winds. During the night west winds increased, reaching gale force by morning.

September 12.—8 a. m., 72°; 2 p. m., 75°; 11 p. m., 64°. Fair, with west gales, diminishing in force during the day. On the morning of the 7th indications were first noticed of an approaching northeast storm. Unsettled weather continued until the night of the 11th. The west gale which came on during the night of the 11th broke the longest spell of hot weather on record for this place.

September 13.—8 a. m., 64°; 2 p. m., 77°; 8 p. m., 68°. Fair, with light winds, mostly easterly. There were indications of a coming storm at night.

September 14.—8 a. m., 65°; 2 p. m., 68°; 9 p. m., 62°. Generally cloudy, with northeast winds.

September 15.—8 a. m., 60°; 2 p. m., 62°; 9 p. m., 60°. Rain and fog, with northeast winds. The rain was quite heavy during the afternoon and evening. It stopped at midnight. High northeast winds prevailed during the morning, but diminished rapidly between 12 m. and 1 p. m., and were only fresh during the afternoon. They shifted to south then to southwest between 6 and 9 p. m.

September 16.—8 a. m., 62°; 2 p. m., 70°; 10 p. m., 58°. Fair, with brisk winds; westerly shifting to northwest winds, and increased during the night, with a cool wave.

September 17.—8 a. m., 48°; 2 p. m., 54°; 10 p. m., 48°. Fair, with brisk to high northwest winds.

September 18.—8 a. m., 44°; 2 p. m., 55°; 9 p. m., 50°. Fair, with brisk northwest winds diminishing.

September 19.—8 a. m., 40°; 2 p. m., 58°; 10 p. m., 50°. Fair, with light north shifting to southeast winds in the afternoon, and becoming brisk at night.

September 20.—8. a. m., 56°; 2 p. m., 64°; 10 p. m., 60°. Partly cloudy, with southwest becoming brisk southeast winds at night. A little rain fell during the night.

September 21.—8 a. m., 58°; 2 p. m., 65°; 10 p. m., 60°. Generally cloudy, with light winds becoming southeast at night.

September 22.—8 a. m., 58°; 2 p. m., 63°; 10 p. m., 58°. Partly cloudy, with southwest winds.

September 23.—8 a. m., 52°; 2 p. m., 60°; 9 p. m., 56°. Rain in morning, generally fair in afternoon, southwest winds.

September 24.—8 a. m., 54°; 2 p. m., 65°; 8 p. m., 58°. Fair, with light southwest winds.

September 25.—8 a. m., 58°; 2 p. m., 69°; 10 p. m., 60°. Fair; light southwest winds.

Light frost was noticed by others on the morning of the 19th.

OBSERVATIONS AT HONOLULU.

Through the kind cooperation of Mr. Curtis J. Lyons, Meteorologist to the Government Survey, the monthly report of meteorological conditions at Honolulu is now made partly in accordance with the new form, No. 1040, and the arrangement of the columns, therefore, differs from those previously published.

Meteorological observations at Honolulu, September, 1900.

The station is at 21° 18′ N., 157° 50′ W.

Hawaiian standard time is 10h 30m slow of Greenwich time. Honolulu local mean time is 10h 31m slow of Greenwich.

Pressure is corrected for temperature and reduced to sea level, and the gravity correction, —0.06, has been applied.

The average direction and force of the wind and the average cloudiness for the whole day are given unless they have varied more than usual, in which case the extremes are given. The scale of wind force is 0 to 12, or Beaufort scale. Two directions of wind, or values of wind force or amounts of cloudiness, connected by a dash, indicate change from one to the other.

The rainfall for twenty-four hours is measured at 9 a. m. local or 7:31 p. m., Greenwich time, on the respective dates.

The rain gage, 8 inches in diameter, is 1 foot above ground. Thermometer, 9 feet above ground. Ground is 43 feet, and the barometer 50 feet above sea level.

Date.	Pressure at sea level.	Temperature.		During twenty-four hours preceding 1 p. m. Greenwich time, or 2:30 a. m. Honolulu time.									Total rainfall at 9 a. m., local time.
				Temperature.		Means.		Wind.		Average cloudiness.	Sea-level pressures.		
		Dry bulb.	Wet bulb.	Maximum.	Minimum.	Dew-point.	Relative humidity.	Prevailing direction.	Force.		Maximum.	Minimum.	
	*	†	†			‡	‡		§				
1	29.93	76	70	86	73	67.7	68	ne.	2	2-5	29.97	29.90	0.11
2	29.93	76	70.5	85	75	66.5	65	ne.	3	2	30.00	29.92	0.03
3	29.95	77	70	86	76	67.7	67	ne.	4	3	30.01	29.94	0.04
4	29.96	77	69.5	86	75	67.7	67	ne.	3-4	4	30.01	29.94	0.10
5	29.92	75	70	85	74	67.3	66	ne.	4-1	4	30.00	29.91	0.02
6	29 91	75	69	85	75	66.5	66	ne.	3-1	2	29.97	29.90	0.00
7	29.93	76	68.5	86	75	66.0	64	ne.	3	3	29.98	29.89	0.00
8	29.93	76	69.5	85	75	65.3	62	ne.	3	3	29.99	29.90	0.00
9	29.92	73	69	86	75	66.3	66	ne.	3-0	2-8	29.98	29.91	0.00
10	29.89	73	69	86	73	68.0	70	ne.	0-2	3-9	29.96	29.88	0.03
11	29.91	71	68.5	87	72	67.5	70	ne.	0-2	2-0	29.94	29.86	0.00
12	29.96	71	69	85	71	69.7	77	s-w.	1-0	3-8-0	29.99	29.90	0.00
13	29.97	78	69	88	71	69.3	73	w-ne.	0-2	5	30.03	29.95	0.02
14	29.98	76	69	87	77	65.5	61	nne.	3	5	30.03	29.97	0.03
15	29.98	76	70	86	75	66.0	63	ne.	4	4	30.03	29.95	0.02
16	29.99	76	68	86	76	66.0	64	ne.	4-2	2	30.05	29.95	0.00
17	29.99	75	69	85	76	63.3	59	ene.	3	3-5	30.05	29.97	0.04
18	29.98	78	69	85	75	65.5	64	ne.	3-4	5	30.04	29.96	0.04
19	30.05	77	69	85	77	65.0	60	ne.	4-5	4	30.06	29.96	0.03
20	30.00	77	69	86	76	65.7	64	ne.	4-2	4	30.08	29.99	0.08
21	29.97	75	69.5	85	76	65.5	63	ne.	3	4	30.04	29.95	0.48
22	29.94	76	68	83	70	66.3	66	ne.	2	5	30.01	29.92	0.15
23	29.92	74	69	84	72	65.0	63	ne.	3	2	29.98	29.87	0.11
24	29.89	75	70	84	72	67.7	71	ne.	3	4-2	29.97	29.85	0.06
25	29.89	76	69.5	83	72	67.7	71	ene.	3	5	29.96	29.85	0.01
26	29.92	76	70	85	75	67.3	68	ne.	3	3	29.97	29.86	0.01
27	29.92	75	69.5	86	71	66.3	64	nne.	3	3	29.96	29.88	0.01
28	29.91	70	68.5	85	75	68.3	74	ne.	2	6	29.97	29.90	0.12
29	29.90	70	68.5	85	70	68.0	74	ne.	2	4	29.96	29.88	0.00
30	29.89	70	67.5	85	70	68.7	78	s-ne.	1-0	4-8	29.96	29.88	0.01
Sums	......	......	.....	.....	.....	.....	.....	....	.....	.....	......	.....	1.55
Means	29.941	74.9	.....	85.3	73.7	66.8	67.2	....	2.6	3.8	29.998	29.913	......
Departure	—.016	......	......	.....	.....	+0.6	—1.2	....	.....	—0.2	......	.....	—0.30

Mean temperature for September, 1900 (6 + 2 + 9) + 3 = 78.4; normal is 77.5. Mean pressure for September (9 + 3) + 2 is 29.953; normal is 29.969.

* This pressure is as recorded at 1 p. m., Greenwich time. † These temperatures are observed at 6 a. m., local, or 4:31 p. m., Greenwich time. ‡ These values are the means of (6+9+2+9) + 4. § Beaufort scale.

METEOROLOGICAL OBSERVATIONS AT EAGLE, ALASKA.

Summarized by Prof. ALFRED J. HENRY.

In a previous REVIEW (Vol. XXVII, p. 59) it was stated that the central station of the Alaska climate and crop service would be transferred from Sitka to Eagle, and that Mr. U. G. Myers, a trained observer of the Weather Bureau, would be placed in charge.

Mr. Myers succeeded in opening a station at Eagle, latitude

64° 46′ N., longitude 141° 12′ W., about the middle of August, 1899. Observations were begun at once and have been continued uninterruptedly ever since.

The equipment of the station is similar to that of any first-class station of the Bureau, viz, two mercurial barometers, two dry thermometers, two self-registering maximum and minimum thermometers, soil thermometer, whirling psychrometer, thermograph, barograph, and wind velocity register. Three observations are made daily, viz, at 8 a. m., 3 p. m., and 8 p. m., mean local time, respectively. The 8 o'clock observations only have been summarized and the results are given in the table below. The pressure is corrected for temperature, instrumental error, and reduced to standard gravity. The elevation of the barometer above sea level is approximately 573 feet.

The lowest temperature observed during the year was 68° below zero in January, 1900. The average temperature for that month was 25° below zero. The temperature fell to 32° or below in every month of the year, and zero temperatures were recorded in seven of the twelve months.

The maximum temperature of the year was 87° in June; the minimum for the same month was 28°, thus giving a monthly range of 59°. The monthly range in January was 91°, viz, from a maximum of 23° above zero, to a minimum of 68° below. The warmest month was July, with a mean temperature of 57°, a mean maximum of 72°, and a mean minimum of 42°. The lowest temperature recorded in July was 31°.

The total precipitation was 10.17 inches, about what would be anticipated for the interior of Alaska. The greatest rainfall in any twenty-four hours was 0.75 inch in August. Showers were rather frequent during the warm months.

High wind velocities were not experienced at any time. The highest 5-minute velocity was but 32 miles per hour from the east. At no time during the year did the wind approach a gale.

Nearly 50 per cent of the winds were from an easterly quarter, although a relatively large number of west and northwest winds were also observed; in fact, about 70 per cent of the winds were either from the east-southeast or west-northwest. The valley of the Yukon, at Eagle, extends in an east-southeast west-northwest direction, and this fact may partly account for the predominance of east-southeast and west-northwest winds.

Three thunderstorms occurred, one each in May, June, and July.

Meteorological observations at Eagle, Alaska.

(Latitude, 64° 46′ N.; Longitude, 141° 12′ W. Height of barometer above sea level, 573 feet. Height of thermometer above ground, 6 feet; rain gage, 3 feet; anemometer cups, 26 feet.

Month.	Pressure. Monthly mean.	Pressure. Extremes. Maximum.	Pressure. Extremes. Minimum.	Temparature. Mean. 8 a. m.	Temparature. Mean. 8 p. m.	Temparature. Mean. Maximum.	Temparature. Mean. Minimum.	Temparature. Mean. Monthly.	Temparature. Extremes. Maximum.	Temparature. Extremes. Minimum.	Moisture. Dew-point. 8 a. m.	Moisture. Dew-point. 8 p. m.	Moisture. Relative humidity. 8 a. m.	Moisture. Relative humidity. 8 p. m.	Moisture. Vapor pressure. 8 a. m.	Moisture. Vapor pressure. 8 p. m.	Moisture. Precipitation. Total.	Moisture. Precipitation. Maximum in 24 hours.	Moisture. Cloudiness. 8 a. m.	Moisture. Cloudiness. 8 p. m.	Moisture. Cloudiness. Daylight.
1899.	*Inches.*	*Inches.*	*Inches.*	°	°	°	°	°	°	°	°	°	%	%	*Ins.*	*Ins.*	*Ins.*	*Ins.*			
September	28.86	29.39	28.38	41.2	41.1	52.1	30.0	41.0	66	8	34	33	76	74	.197	.194	0.39	0.11	7.7	7.4	7.7
October	28.88	29.64	28.07	19.9	20.7	28.4	12.4	20.4	41	−19	15	15	79	79	.085	.090	0.65	0.35	7.8	6.2	7.4
November	28.75	29.29	28.26	2.4	1.4	8.3	− 5.8	1.2	33	−25	− 1	− 2	85	86	.042	.040	0.52	0.27	8.3	5.8	8.4
December	29.02	29.96	28.14	−19.9	−17.9	−11.2	−26.8	−19.0	31	−57	−22	−20	93	91	.022	.023	0.26	0.13	4.4	4.7	4.9
1900.																					
January	29.04	29.64	28.31	−25.9	−24.7	−17.5	−32.3	−24.9	23	−68	−27	−26	93	93	.014	.016	0.52	0.30	4.5	4.5	4.9
February	29.21	29.82	28.36	− 8.1	− 6.3	4.9	−16.9	− 6.0	18	−51	−11	−10	87	83	.028	.028	0.39	0.29	5.4	3.6	4.9
March	29.10	29.92	28.67	8.4	13.9	29.2	− 3.1	13.0	56	−46	4	8	84	78	.074	.088	0.02	0.01	4.3	3.1	3.6
April	28.79	29.51	28.21	31.6	30.1	42.8	15.8	29.3	54	−12	21	21	65	69	.114	.116	0.42	0.24	5.4	5.8	5.9
May	28.80	29.48	28.42	44.7	47.9	56.4	28.0	42.2	69	20	30	32	58	55	.166	.179	0.84	0.35	5.3	4.8	5.0
June	28.85	29.20	28.27	55.6	58.4	67.3	38.0	52.6	87	28	43	42	64	57	.286	.282	1.57	0.48	5.3	6.8	6.2
July	28.91	29.12	28.64	60.1	62.8	72.2	41.6	56.9	81	31	49	49	67	63	.347	.352	1.88	0.46	5.1	4.3	5.1
August	28.90	29.33	28.53	50.1	51.1	61.4	36.9	49.2	79	25	43	43	78	75	.284	.282	2.71	0.75	7.4	7.5	7.7
Year	28.93	29.52	28.36	21.7	23.2	32.9	9.8	21.3	87	−68	15	15	77	75	.138	.141	10.17	0.75	5.9	5.3	6.0

Month.	Wind. By self-registers. Average hourly velocity.	Wind. By self-registers. Prevailing direction.	Wind. By self-registers. Maximum velocity per hour.	Wind. By self-registers. Direction at time of maximum velocity.	Wind. By self-registers. No. of days with gales 40 miles per hour or over.	Wind. Number of winds, 8 a. m. and 8 p. m. North.	Northeast.	East.	Southeast.	South.	Southwest.	West.	Northwest.	Calm.	Number of days. Clear.	Partly cloudy.	Cloudy.	Precipitation. .01 inch and over.	Precipitation. .04 inch and over.	Snow.	Hail.	Fog.	Maximum temperature. Below 32°.	Maximum temperature. Above 90°.	Minimum temperature below 32°.	Electricity. Thunderstorms.	Electricity. Auroras.
1899.	*Miles.*		*Miles.*																								
September	6.0	se.	30	se.	0	6	3	1	24	5	3	8	8	2	3	7	20	7	4	1	0	0	1	0	17	0	3
October	6.4	se.	20	se.	0	5	4	1	23	7	7	1	14	0	4	9	18	7	4	7	0	0	20	0	30	0	3
November	4.7	w.	21	e.	0	3	16	4	5	4	3	19	5	1	3	4	23	5	2	5	0	0	29	0	30	0	6
December	3.3	ne.	26	e.	0	0	12	10	5	7	2	7	3	16	15	8	13	6	3	6	0	0	31	0	31	0	5
1900.																											
January	4.5	e.	29	e.	0	3	7	12	4	0	2	4	7	23	14	6	11	7	3	7	0	0	31	0	31	0	5
February	5.9	e.	32	e.	0	1	7	13	8	0	1	9	3	14	11	8	9	5	3	5	0	0	28	0	28	0	4
March	4.4	w.	28	e.	0	3	6	8	7	4	3	21	3	7	17	8	6	2	0	2	0	0	14	0	30	0	9
April	5.5	se.	23	se.	0	5	6	10	15	2	2	12	6	2	6	13	11	6	4	5	0	0	6	0	29	0	4
May	5.8	e.	27	s.	0	7	12	17	8	3	0	11	3	1	9	17	5	7	6	1	0	0	0	0	25	1	0
June	5.1	w.	28	e.	0	4	12	13	4	0	4	14	9	0	8	7	15	13	9	0	1	0	0	0	6	0	0
July	4.2	nw.	29	nw.	0	4	12	10	4	1	2	10	19	0	12	9	10	13	10	0	0	0	0	0	1	1	0
August	4.5	w.	23	sw.	0	2	5	12	7	1	5	14	10	6	2	9	20	16	11	1	1	1	0	0	9	1	0
Year	5.0	w.	32	e.	0	43	102	111	114	34	34	130	90	72	104	100	161	94	59	40	2	1	160	0	267	3	39

RESULTS OF A BALLOON ASCENSION AT ST. PETERSBURG, MAY 20 / JUNE 1, 1878.[1]

By Gen. M RYKATCHEFF.

The following are the instruments that I took with me:

1. A Richter syphon barometer.

2. A Richter aneroid, verified under the receiver of a pneumatic pump. Besides the corrections thus found the aneroid records were subjected to still further corrections relative to the retardation in the registration of the aneroid; these corrections were determined during the ascension by comparing the simultaneous records of the aneroid and of the mercurial barometer.

I had three very sensitive mercurial thermometers, with fine, long cylindrical bulbs. One of these thermometers showed every variation of temperature four times more quickly than the thermometer at the stations of the Central Physical Observatory, the other two thermometers surpassed it by from one and one-half to two times. One of these served as a wet bulb thermometer.

Poulkova mean time.	Elevations.		Differences.	Poulkova mean time.	Elevations.		Differences.
	Trigonometric.	Barometric.			Trigonometric.	Barometric.	
h. m. s.	*Meters.*	*Meters.*		*h. m. s.*	*Meters.*	*Meters.*	
2 51 21	3,776	3,914	−138	4 23 37	2,353	2,394	−41
51 48	3,817	3,925	−108	26 37	2,412	2,446	−34
56 59	3,920	4,008	− 88	27 24	2,415	2,500	−85
59 49	3,977	4,076	− 99	31 52	2,552	2,588	−36
3 1 19	4,002	4,084	− 82	35 18	2,745	2,793	−48
11 16	3,719	3,746	− 27	36 50	2,866	2,908	−42
11 49	3,650	3,726	− 76	38 44	2,999	3,045	−46
27 49	2,731	2,836	−105	46 16	3,362	3,429	−67
31 52	2,919	2,967	− 48	49 49	3,533	3,597	−64
35 44	3,155	3,216	− 61	53 39	3,742	3,782	−40
40 59	3,363	3,407	− 44	56 35	3,854	3,878	−24
45 19	3,489	3,526	− 37	59 34	3,977	3,998	−21
51 47	3,712	3,816	−104	5 6 24	4,039	4,058	−19
59 59	3,669	3,700	− 31	6 24	4,046	4,058	−12
4 6 5	3,594	3,639	− 45	6 49	4,040	4,031	+ 9
13 49	3,282	3,267	+ 15				

The thermometers and the hygrometer were placed outside of the basket on special supports. In order to protect the thermometers from radiation they were put into double boxes without bottoms or covers.

All the instruments had previously been verified and the corresponding corrections have been added to their records.

The altitudes were calculated (1) by the ordinary barometric reduction formula; (2) by the trigonometric method, sighting the balloon with theodolites from St. Petersburg (from the Central Physical Observatory and the Academy of Sciences), from Poulkova, and Cronstadt.

In all, thirty-four trigonometric determinations were made; in thirty-one of these cases it was also possible to calculate the elevation by the barometer.

The table given above contains, for these thirty-one cases, the hour, the trigonometric and barometric altitudes, and the differences between these values.

The mean difference deduced from the most accurate twenty-six observations is −61 meters.

The variation of the temperature with altitude may be seen in the following table:

Altitudes.	Variation of temperature for every 250 meters.	Change of elevation corresponding to a variation of 1°.
Meters.	°	*Meters.*
0−2,500	−1.5	162
2,500−2,750	−1.3	192
2,750−3,000	−1.2	208
3,000−3,250	−1.2	208
3,250−3,500	−1.2	208
3,500−3,750	−1.3	192
3,750−4,000	−2.0	125
Mean	−1.47	172

Results of the observations made during the ascension of May 20 / *June* 1, 1878.

The atmospheric pressures observed with the aneroid are marked with an asterisk (*); the interpolated relative humidity is put in parenthesis.

Number and chronological order of observation.	Poulkova mean time.	Barometric record. Temperature 0° C.	Temperature, C.			Relative humidity.	Vapor tension.	Altitude determined barometrically.
			Thermometer No. 5, corrected.	Thermometer No. 145, corrected.	Adopted temperature.			
1	2	3	4	5	6	7	8	9
	h. m. s.	*mm.*	°	°	°	%	*mm.*	*Meters.*
On ground	2 35		19.9	19.5		11		
1.	2 43 5	562.5*			+ 0.9	(38)	1.9	2,598.3
	2 43 27		+ 0.9					
	2 43 41			+ 0.9				
2.	2 44 42	529.2*			− 1.2	(37)	1.5	3,087.1
	2 44 55		− 1.2					
	2 45 9			− 1.7				
	2 45 22	513.6			− 1.8	(37)	1.5	3,325.4
	2 45 36					37		
3.	2 46 17		− 2.3					
	2 46 31			− 2.4				
	2 46 45	508.5			− 2.5	(37)	1.4	3,405.1
4.	2 47 27		− 1.8					
	2 47 55	495.5			− 2.8	(37)	1.4	3,610.7
5.	2 48 37			− 3.0				
	2 48 47	487.9			− 3.0	(37)	1.3	3,733.3
6.	2 49 39			− 3.1				
	2 49 53					37		
7.	2 51 25	476.8			+ 1.1	(37)	1.8	3,917.5
	2 51 41			+ 1.1				
8.	2 52 18		+ 1.4					
	2 52 32			+ 1.4				
	2 52 46	475.3			+ 1.4	(37)	1.8	3,942.9
9.	2 56 31			+ 2.0				
	2 56 45	471.9			+ 1.7	(36)	1.8	4,001.5
10.	2 57 43		+ 0.4					
	2 58 5			− 0.5				
	2 59 12	467.8			− 2.6	(36)	1.3	4,072.1
11.	3 1 4			− 4.2				
12.	3 1 49			− 4.5				
	3 1 59					36		
	3 2 9	466.8			− 4.8	(36)	1.2	4,088.8
13.	3 3 2			− 5.7				
14.	3 3 16					35		
15.	3 12 1	489.3*			− 3.6	(35)	1.2	3,718.1
	3 12 37			− 3.6				
	3 12 47					35		
16.	3 13 18	500.5*			− 2.6	(36)	1.3	3,539.1
	3 13 42					36		
	3 13 56			− 1.5				
17.	3 27 49	546.6			+ 1.2	(29)	1.5	2,836.0
	3 29 1					29		
	3 29 15			+ 1.2				
18.	3 31 19	540.2			+ 0.9	(30)	1.5	2,929.4
	3 31 41					30		
	3 32 26			+ 0.7				
19.	3 32 57	532.6			+ 0.6	(30)	1.4	3,042.4
	3 33 13			+ 0.5				
20.	3 34 8			+ 0.1				
	3 34 46					29		
	3 35 5	522.7			− 0.2	(29)	1.3	3,191.9

[1] In the Annales of the Central Meteorological Bureau of France for 1896 there is an elaborate memoir by Prof. A. Angot on the barometric formula of Laplace and the proper method of applying it to the problems of hypsometry, especially to the calculation of the height of a barograph carried up by a sounding balloon or kite. Angot shows that, owing to the unequal and irregular changes of temperature and moisture in the successive layers of atmosphere, it is not possible to compute the altitude as accurately as is desirable unless we carry out the computation for each individual layer and then add the results together. This computation by layers was, perhaps, not a wholly new idea, having been quite independently used by Berson and Hergesell the year before, and especially by Rykatcheff in a memoir published in 1882 in the Zapiski[2] of the Russian Geographical Society (see the Protocol of the International Aeronautic Commission, 1899, p. 127). As this method will be needed in the accurate discussion of observations made in the upper strata of the atmosphere and in the reduction of pressure and temperature observed at low levels upward to higher levels, the Editor, instead of attempting an unsatisfactory abstract of Rykatcheff's memoir published in Russian, has requested him to kindly communicate such instructions and tables as he deems appropriate to the solution of this problem, which will undoubtedly be one of the most important that will engage the attention of the coming generation of meteorologists. The actual results of Rykatcheff's ascension of June 1, 1878, are published herewith as communicated by him September 20 / October 3, 1900, and undoubtedly present us with the first series of correlated altitudes, pressures, temperatures, humidities, and moments of observation that have been determined with the accuracy needed in the present stage of meteorology. The Editor is pleased to thus be able to make these accessible to students.—ED.

[2] Memoirs of the Imperial Russian Geographical Society, Vol. VI, No. 2, pp. 1-77, St. Petersburg, 1882.

Results of observations, etc.—Continued.

Number and chronological order of observation.	Poulkova mean time.	Barometric record. Temperature 0° C.	Temperature, C. Thermometer No. 5, corrected.	Thermometer No. 145, corrected.	Adopted temperature.	Relative humidity.	Vapor tension.	Altitude determined barometrically.
1	2 h. m. s.	3 mm.	4 °	5 °	6 °	7 %	8 mm.	9 Meters.
21	3 36 17			− 0.5				
	3 36 33					29		
22	3 36 50	518.4			− 0.3	(29)	1.3	3,257.4
	3 37 22	516.4			− 0.2	(29)	1.3	3,287.9
	3 38 8		0.0					
	3 38 22					29		
	3 38 36			− 0.4				
	3 38 51	514.8			− 0.5	(29)	1.2	3,312.5
23	3 41 9	508.2			− 1.0	(29)	1.3	3,414.4
	3 41 39			− 1.1				
	3 41 49					28.5		
24	3 41 59	506.2			− 1.3	(29)	1.2	3,445.4
	3 43 22					28.5		
	3 43 26			− 2.4				
	3 44 4	503.7			− 1.6	(29)	1.2	3,484.0
	3 44 24			− 1.2				
	3 45 1					28.5		
25	3 45 48		− 0.7					
26	3 48 26	494.5			+ 0.1	(29)	1.3	3,629.4
	3 48 50			+ 0.2				
27	3 49 45			− 0.5				
	3 50 23			− 1.7				
	3 50 52	486.9			− 1.7	(29)	1.2	3,752.2
	3 51 21					28.5		
28	3 52 3	481.8			− 1.5	(29)	1.2	3,835.4
	3 52 47			− 1.5				
	3 53 1					28.5		
29	3 54 43	479.5			− 3.7	(28)	1.0	3,878.1
30	3 57 40			− 5.5				
	3 57 57	484.4			− 5.5	(28)	0.9	3,790.4
31	3 58 28			− 5.6				
	3 58 43					28		
32	3 59 59	490.0			− 5.5	(28)	0.9	3,699.9
	4 0 42					29		
33	4 7 23			− 5.0				
	4 7 52					28.5		
34	4 8 6	495.0			− 4.6?	(28)	0.9	3,618.8
	4 9 3			− 4.0				
35	4 11 13			− 3.2				
	4 11 42	507.7			− 3.1	(28)	1.0	3,415.0
36	4 12 23			− 3.0				
	4 12 39					28.5		
	4 12 52	511.0			− 3.8	(28)	1.0	3,364.0
37	4 13 19			− 4.1				
	4 13 34					28		
38	4 13 49	518.1*			− 3.8	(28)	1.0	3,266.9
	4 14 4			− 3.7				
39	4 14 34	533.1*			− 3.1	(28)	1.0	3,040.6
	4 14 48			− 3.0				
40	4 16 19	543.3*			− 0.5	(28)	1.2	2,889.0
	4 16 33			− 0.5				
41	4 17 59	548.4*			+ 0.5	(28)	1.3	2,813.4
	4 18 9		+ 0.5					
	4 18 19			+ 1.0				
42	4 18 53			+ 1.5				
43	4 19 35	558.4*			+ 2.1	(28)	1.6	2,667.2
	4 19 42			+ 2.2				
	4 19 48					28.5		
44	4 20 7	568.5*			+ 2.2	(28)	1.6	2,522.2
	4 20 20			+ 2.2				
45	4 21 15			+ 2.8				
46	4 22 41	578.6*			+ 2.5	(28)	1.6	2,378.6
	4 22 55			+ 2.5				
	4 23 9					28		
47	4 27 53			+ 1.2				
	4 28 22					27		
48	4 30 41	568.5			+ 2.4	(27)	1.5	2,514.2
	4 30 55			+ 2.5				
	4 31 10	565.4			+ 2.6	(27)	1.5	2,558.8
49	4 32 11			+ 3.0				
	4 32 30					26		
50	4 32 40	560.1			+ 2.7	(26)	1.5	2,621.3
	4 33 28			+ 2.1				
	4 33 42					26		
	4 33 57	556.5			+ 2.0	(26)	1.5	2,612.3
51	4 35 56	544.3			+ 1.3	(26)	1.3	2,849.3
	4 36 9					26		
52	4 36 59			+ 0.7				
	4 37 12	538.7			+ 0.8	(26)	1.3	2,931.3
53	4 37 39	536.9*			+ 1.1	(26)	1.3	2,957.7
	4 37 53			+ 1.2				
54	4 38 54			− 0.4				
	4 39 4		+ 0.2					
55	4 39 40	526.1*			− 0.8	(25)	1.1	3,119.3
	4 40 7			− 1.0				
	4 40 33					25		
	4 40 59		− 0.9					
	4 41 6			− 1.2				
56	4 42 21			− 0.7				
	4 42 36		− 0.5					
	4 42 51					25		
57	4 43 20	514.8*			+ 0.2	(25)	1.1	3,290.0
	4 43 35			+ 0.5				
	4 43 50					25		
	4 44 5	510.0			+ 0.5	(25)	1.2	3,358.2

Results of observations, etc.—Continued.

Number and chronological order of observation.	Poulkova mean time.	Barometric record. Temperature 0° C.	Temperature, C. Thermometer No. 5, corrected.	Thermometer No. 145, corrected.	Adopted temperature.	Relative humidity.	Vapor tension.	Altitude determined barometrically.
1	2 h. m. s.	3 mm.	4 °	5 °	6 °	7 %	8 mm.	9 meters.
57	4 44 20			+ 0.5				
	4 44 50	509.0			− 0.1	(25)	1.1	3,379.7
	4 45 4					25		
	4 45 34			− 0.9				
58	4 46 4		− 1.1					
59	4 46 35	505.1*			− 1.2	(25)	1.1	3,439.8
	4 46 50			− 1.2				
	4 47 6		− 1.5					
	4 47 21					25		
	4 47 52			− 2.2		(25)		
	4 48 8		− 1.9			25		
	4 48 23	499.9			− 2.2	(25)	1.0	3,520.9
	4 48 39					25		
60	4 49 31			− 2.2				
61	4 50 6			− 3.1				
	4 50 22		− 2.9					
	4 50 31	492.7			− 3.1	(25)	0.9	3,634.3
62	4 50 59			− 3.0				
	4 51 9		− 3.1					
	4 51 19					25		
	4 51 29	490.7			− 3.3	(25)	0.9	3,665.6
63	4 52 3			− 3.6				
	4 52 14		− 3.5					
	4 52 26					25		
	4 52 38	487.7			− 2.9	(25)	0.9	3,713.4
64	4 53 14			− 2.2				
	4 53 27		− 1.4		− 2.9			
65	4 53 59	482.1			− 2.1	(25)	1.0	3,803.9
	4 54 18			− 2.0				
66	4 54 58	478.4*			− 2.8	(25)	0.9	3,864.4
	4 55 19			− 2.8				
67	4 55 54	479.1*			− 2.8	(25)	0.9	3,852.1
	4 56 8			− 2.8				
68	4 56 38	477.4*			− 2.9	(25)	0.9	3,879.9
	4 56 53			− 3.0				
69	4 57 53	475.4*			− 3.1	(25)	0.9	3,912.2
	4 58 7			− 3.2				
	4 58 20		− 3.1					
70	4 58 49	473.1*			− 3.5	(25)	0.9	3,949.9
	4 59 4			− 3.6				
71	4 59 49	469.3*			− 4.6	(25)	0.8	4,015.2
	5 0 3			− 4.6				
72	5 6 34	467.3*			− 8.0	(25)	0.6	4,046.5
	5 6 42			− 8.0				
73	5 6 58	468.9*			− 8.0	(25)	0.6	4,019.9
	5 7 6			− 8.0				
74	5 7 23	469.8*			− 8.0	(25)	0.6	4,005.0
	5 7 30			− 8.0				
75	5 33 4			− 0.5				
76	5 33 29	539 5						2,911.6
77	5 34 4	531.1*			0.0	(26)	1.2	2,948.8
	5 34 29			+ 0.2				
78	5 35 39			− 0.5				
79	5 35 59			− 0.5				
80	5 36 18	554.8*			+ 0.5	(26)	1.3	2,686.8
	5 36 26			+ 1.0				
81	5 36 56	562.3*			+ 0.9	(26)	1.3	2,579.0
	5 37 18			+ 0.8				
82	5 38 3			+ 1.2				
83	5 38 54	567.9*			+ 1.0	(26)	1.2	2,490.2
	5 39 8			+ 1.0				
84	5 43 4	576.9*			+ 2.3	(26)	1.5	2,372.2
	5 43 18			+ 2.3				
	5 43 33					26		
85	5 46 14	571.9*			+ 2.3	(27)	1.5	2,442.2
	5 46 28			+ 2.3				
	5 46 43					27		
86	5 49 42			+ 1.5				
	5 50 27					26		
87	5 51 4	579.0*			+ 1.2	(26)	1.3	2,342.4
	5 51 18			+ 1.2				
88	5 55 41	576.9*			+ 1.7	(26)	1.4	2,371.5
	5 56 3			+ 1.7				
	5 56 25					25.5		
89	5 57 24	576.9*			+ 0.9	(25)	1.2	2,371.0
	5 57 38			+ 1.0				
90	5 59 24	587.0*			+ 0.7	(26)	1.2	2,231.5
	5 59 38			+ 0.7				
91	6 1 34	604.0*			+ 0.7	(27)	1.3	2,002.1
	6 1 48			+ 0.7				
92	6 12 4	667.0			+ 8.0	(35)	2.8	1,192.0
	6 12 18			+ 8.0				
	6 12 33					(38)		
93	6 13 24	687.0			+ 9.5	(38)	3.6	946.5
94	6 14 28	692.0*			+11.0	(38)	3.7	885.0
	6 14 42			+11.0				

THE GULF STREAM MYTH.

By HARVEY MAITLAND WATTS.

There are few things more curious to-day than the defer-

ence paid in educational circles and in the newspapers to exploded theories as to climate and weather causation. Of all cases of adherence to the old beliefs, the abandoned camp of an earlier, cruder science, the remarkable deference paid the Gulf Stream theory of climate is particularly a case in point. This comes naturally from the failure to grasp the essential facts of the atmospheric circulation in the north temperate zone, whose unfailing west to east drift, broken up into two eddies, the cyclonic and the anticyclonic, distributes weather and conditions climate. Once grasp what this west to east drift means and the explanation of climate and weather is an open book. Though the theory still persists that the Gulf Stream alone by its own inherent warmth causes the mild climate of northwestern Europe, and though it is still referred to in a familiar off-hand manner by school teachers in teaching physical geography and by writers who ought to know better, as one refers to the existence of Saturn's rings, yet most people seem unfamiliar with the broader restatements of the problem now made by meteorologists.

By itself alone the Gulf Stream has as much effect on the climate of northwestern Europe as the fly in the fable had in carrying the stagecoach up the hill. The mild climate of northwestern Europe is due, not to the Gulf Stream, but to the prevailing eastward and northeastward drift of the circumpolar atmospheric circulation, whose aerial currents, and not the Gulf Stream, distribute the heat conserved by the whole Atlantic Ocean north of latitude 35° (roughly) over Europe. The entire surface of the Atlantic Ocean north of the region of the trade winds, or rather, north and west of the center of the great north Atlantic anticyclone, is drifted to the northeast by the prevailing aerial drift, which drift, and not the ocean currents, carries the beneficent influences of the ocean over the European islands and the shores to the east and northeast. The Gulf Stream, itself a result of wind motion, being produced by the joint action of the Atlantic anticyclones, is not distinguishable in temperature or "set" from the rest of the ocean by the time it gets east of Newfoundland, yet it has been given the credit that belongs to the whole mass of the Atlantic, so far as the latent power to effect climate is concerned, while at the same time the determining function played by the aerial currents of the great circumpolar drift is completely ignored. The same fallacy prevails as to the power of the Japan current to affect the coastal climate of northwestern North America.

Perhaps the most amusing recent instance of repetition of all the old rhetoric and all the old error about the Gulf Stream is in an article by Mr. F. T. Bullen, in the London Spectator, which, written in a high class publication and in the name of science, merits attention and correction. Mr. Bullen says:

> But who among us with the slightest smattering of physiography is there that is not assured that but for the genial warmth of this mighty sea-river our islands would revert to their condition at the Glacial Period; who is there but feels a shiver of dread pass over his scalp when he contemplates the possibility of any diversion of its life-giving waters from our shores? The bare suggestion of such a calamity is most terrifying

Now, as a mere matter of climatic fact, were the aerial drift, that is, the circulation of the atmosphere in the north temperate zone, to remain as it is today, and were by any possibility the Gulf Stream to be diverted at the Straits of Florida, no one in England would be a whit the wiser, for it is the aerial drift that has the gift of mildness in its flow. The diversion-of-the-Gulf-Stream bogey may impress those who have a "smattering of physiography," but it has no terror for him who knows that the Gulf Stream myth has nothing to rest on save the bad science of fifty years ago and its recrudescence in the present.

Naturally, wrong about the Gulf Stream, Mr. Bullen is so blind to the facts that modern meteorology has established, that, having endowed the Gulf Stream with virtues and influences that do not belong to it, he naturally does the same for the Kuroshiwo, the Japan current. He says of it: "It is, however, but a poor competitor in beneficence in comparison with our own Gulf Stream, as those who know their Japan in winter can testify." Now, the real fact about this is (and the same is true of the lack of effect of the Gulf Stream on the climate of New York) that since the aerial drift over Japan and over the eastern United States is from west to east, the mitigating effects of the ocean and of currents that lie to the east of the coast, are naturally not carried over the land but eastward over the water. Reverse the aerial current around the world, and Japan, by the mitigating influences of the Pacific Ocean, would have an eternal spring for its climate; while the Atlantic coast States, from North Carolina to Newfoundland would have the mildness of Bermuda, not, however, on account of any one ocean current that laved their shores, but because the conserved warmth of the ocean as a whole was theirs. As it is, the August hot waves, "Indian summer," the "green Christmases," the prolonged mild spells in January and February, the "anticipations of May" that often occur in March and befool the fruit trees are due not to any shifting of the Gulf Stream, but to the intrusion of the Atlantic anticyclone on our coasts. The circulation from the south, which is thus set up in connection with cyclonic areas over the lakes, or on our northern borders, while an anticyclone persists over our Southern States near the coast, is capable of the most surprising climatic effects, and at times seems actually to reverse the seasons.

A REVIEW OF PROFESSOR VERY'S MEMOIR ON ATMOSPHERIC RADIATION.

By N. E. DORSEY, dated October 24, 1900.

As the author informs us, the experiments described in this work were undertaken at the suggestion of Professor Abbe, and their object can best be understood by quoting from a letter written by Professor Abbe to the author November 24, 1891. In this he says:

> Absorption *may be* the absolute inverse of *radiation* for gases, but I don't like to assume this as to intensity, and so I beg to know whether you and Professor Keeler can not undertake the following problem: To determine the absolute radiation in calories from a unit mass of gas at given density and temperature and at ordinary temperatures; not when burning, nor when electrified, but when simply heated.

The radiation was measured by a bolometer constructed after Professor Langley's earlier, double grating pattern. It consisted of 15 strips with a total exposed area of 19 square millimeters. The galvanometer was of the four-coil type, with a suspension system weighing 350 milligrammes, the magnets varying from 9.5 to 6 millimeters in length. The period was about twenty seconds, and the sensitiveness was one division $= 3.48 \times 10^{-9}$ ampere. As used with the bolometer one division corresponds to 5×10^{-8} radim.

Professor Very defines a *radim* as "representing a unit quantity of heat, namely, one gram-water-degree-centigrade heat-unit, lost *as radiation* per square centimeter of surface per second of time, by a heated body, or transmitted by the ether as an equivalent amount of radiant energy through a normal section of one square centimeter in one second of time." But he actually uses as his standard of radiation the difference in the amounts of heat radiated per square centimeter per second to a hemisphere, by blackened copper at 100° C. and at 0° C., which he considers as equivalent to 0.0126 radim.

He employs three different methods for determining the radiation of the gases used, but discards the first as unreliable. The second is to have a jet of hot air of adjustable thickness rise in front of his bolometer and take the deflec-

tions with the jet on, and off. In the third the gas was contained in a metal cylinder closed at one end by a rock salt window and at the other provided with a stuffing-box, through which passed a rod carrying a blackened copper piston whose diameter was but slightly smaller than that of the interior of the cylinder. By changing the position of the piston the length of the radiating column of gas could be regulated as desired. The cylinder was heated by means of four large Bunsen burners. With this arrangement both temperature and pressure could also be varied. Convection currents were very troublesome, and the temperature as determined by the thermometer in the cylinder was uncertain, except when the apparatus had been cooling for a considerable time.

Having described in detail these various methods of work and given numerous tables of unreduced observations, he devotes some thirty pages to a discussion of some of Tyndall's experiments, and of the work done by Paschen, Angström, and others on the radiation and absorption of gases. From the work of these men he obtains certain correction terms which he applies to his observations, and in Table 73, page 112, gives his final results. In my examination of the memoir I have been unable to discover which of the 72 preceding tables contain the observations, which, when corrected by a process also not very clear to me, will give this table. However, as he says that this gives merely "an approximate conception of the relations between total radiation" from unit surface under different conditions of temperature and depth of layer, this makes but little difference.

In conclusion he states: "The results of the present research prove that within moderate depths of only a few meters the radiation of dry air, purified from carbon dioxide, increases quite uniformly with the depth." The radiation from a layer of air one meter deep at 50° C and atmospheric pressure is 0.00068 radim, "as compared with one at 0° C," and for a similar layer of carbon dioxide it is 0.00238 radim, or about three and one-half times that of air. Further increase in depth of carbon dioxide adds but little (at this temperature) to the radiation. The radiation from a layer of steam 152 cm. deep, and at one-sixth of atmospheric pressure, is eight-tenths of that of a black body.

Considering the importance of the work it is a pity more pains were not taken to maintain the radiating gas at a uniform and constant temperature.

MONTHLY STATEMENT OF AVERAGE WEATHER CONDITIONS FOR SEPTEMBER.[1]

By Prof. E. B. GARRIOTT,.

The following statements are based on average weather conditions for September, as determined by long series of observations. As the weather for any given September does not conform strictly to the average conditions, the statements can not be considered as forecasts.

In the middle latitudes of the Northern Hemisphere the settled weather of summer begins to give way to the more pronounced weather types of autumn. In the tropical regions of the oceans September marks the height of the hurricane season.

Over the North Atlantic Ocean the great permanent high barometer area near the Azores decreases in magnitude, and the severer storms which advance from the American continent or adjacent waters pursue a more southerly course than during August. Storms of this class which cross the Atlantic from the American to the European coast average about two a month in September, and the likelihood of encountering them along the transatlantic steamship routes is greater than during the two preceding months. Fog is less frequent over and near the banks of Newfoundland than during August, and the average southern limit of Arctic ice in the North Atlantic is in about latitude north 47°.

All parts of the West Indies are subject to hurricane visitations in September. The hurricanes of this month are, however, somewhat more frequent in an area which embraces Santo Domingo, Haiti, and eastern and central Cuba, where they average about one in three years. The smaller diameter of the vortex of a hurricane renders it improbable that any locality in the area referred to will experience a hurricane oftener than about once in fifteen years. The hurricanes of September sometimes recurve north and northeast along the Atlantic coast of the United States and disappear over the Atlantic east of Newfoundland, and others pass westward over the Gulf of Mexico. The exceptionally destructive character of many of these storms should prompt all possible protective measures in the line of their probable advance as indicated by the warnings of the Weather Bureau.

The typhoons of the Philippine Islands and the China and Japan seas and coasts usually advance from the region east of the Philippine Islands, between the tenth and twentieth parallels of north latitude, move westward, their centers crossing the Philippines north of the fifteenth parallel, and, in a majority of cases, recurve north and northeast near the China coast and pass thence over or near the Japanese Islands. A small proportion of these storms move westward over the China Sea, and in rare instances typhoons appear to originate over the eastern part of the China Sea. The severe September typhoons average about one a year. Torrential rains are of almost daily occurrence in the Philippine Islands in September.

In the United States the most important storms of September advance from the West Indies and the Gulf of Mexico to the Atlantic and Gulf coasts. Storms of this class commonly possess great strength, and on an average of about once in two years they are destructive to shipping and coast industries. Over the Great Lakes gales of marked strength occur on an average about once in each September. As the month advances the rains which occur east of the Mississippi become general, rather than local, in character, and attend the passage of well-marked storms. September is a month of heavy subtropical rains in the south Atlantic and east Gulf coast districts, and a second maximum of rain occurs in the Lake region. Except in the lower Missouri Valley, on the north Pacific coast, and in areas in the Southwest, the rainfall west of the Mississippi is usually very light in September, and over great parts of the middle Plateau region and California no rain, as a rule, falls in that month. During the last half of September killing frost is likely to occur in the Northwestern States and the Lake region, and frost is not uncommon in the Ohio Valley and Tennessee toward the close of September.

[1] The first of this series was for August, 1900, and will be found in the MONTHLY WEATHER REVIEW for that month on page 342.

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NOTES BY THE EDITOR.

STANDARD TIME.

Official information has been received to the effect that on and after January 1, 1901, the official standard time for the whole of Spain will be the so-called western European time, viz, that of the meridian of Greenwich. The interval between midnight and midnight will be divided into twenty-four hours and numbered consecutively from zero to twenty-four. Midnight will be known as twenty-four hours, or the end of the day, but the intervals between midnight and 1 a. m. will not be known as 24:15, for instance, but as 0:15.

We do not know whether the meteorological observers of Spain will now keep their records on the new simultaneous standard time or will adhere to the old local time. In the United States both simultaneous and local time records were kept up for several years (1870–1884) in order that there might be no question as to data needed for the reduction of observations from one system to the other; but at the present time, we believe, only the simultaneous records and times are used. In many climatological investigations it has seemed important to preserve the ancient hours of observation in order to answer questions as to local changes of climate at any locality and as to relative climatic conditions at different localities. But it is now evident that changes in climate, properly so called, are inappreciable to our instrumental observations, however apparent they may be in the changes of flora and fauna. The actual changes of temperature, rainfall, wind, etc., have been far less than the influence upon the instruments of slight changes in exposure and surroundings, as well as in the instrument itself. If, therefore, one inquires whether a record by the same thermometer or the same rain gage for fifty years at the same place shows any change in climate, he has first of all to decide whether the changes in buildings, trees, and grass have in some way affected the records appreciably. There are, doubtless, a few places in Europe where the surroundings have been unchanged for a century, but, unfortunately, it is very rare that meteorological records have been kept in these spots, and still rarer have the thermometers, barometers, rain gages, etc., been kept in one uniform condition of freedom from error.

The modern widespread systems of self-registers now make it possible to obtain records for any moment at stations where formerly it was considered a great feat to secure personal observations every hour of the day and night for one continuous year. For all climatological purposes, the continuous self-registers give far better data than even the old hourly system, and it matters not whether the registration sheets show mean local or standard Greenwich time.

As contrasted with climatology, which deals with monthly, annual, and secular averages, the world has during the past fifty years awakened to the far higher importance of simultaneous observations and weather maps and the study of dynamic and physical meteorology. This branch of meteorology proper is best promoted by the introduction of a uniform standard time throughout the world. The system of hourly meridians, beginning with Greenwich, began to be used in October, 1884, in the United States, in consequence of the labors of W. F. Allen and as the result of a movement which began with a report presented by the Editor in May, 1879, to the American Meteorological Society (see MONTHLY WEATHER REVIEW, 1899, p. 362). This was actively supported by the Weather Bureau from the beginning, as it was evident that only thus could we secure anything like an approach to correct time among all our voluntary and regular observers. The taking of at least one simultaneous observation daily, at 1 p. m., Greenwich time, or 8 a. m. seventy-fifth meridian time, was inaugurated by the Weather Bureau in 1871 for all ships at sea, and adopted in 1873–1875 by all the weather bureaus of the world. This Bureau is still interested in every measure that can contribute to the perfecting of one or more daily simultaneous maps of the condition of the atmosphere throughout the globe.

There seems to be no reason why we should not in future years proceed still further to improve our time system. The counting of the hours from midnight onward to twenty-four hours continuously was in old times quite the custom in Italy, and now that it has been revived by Spain, we believe that the example will be followed by others and, eventually, become universal in spite of the proverbial conservatism of mankind. From this it will be but a single step to relinquish the local hour meridians and use Greenwich time proper. We have in our lifetime seen the relinquishment of Ferro, Paris, San Fernando, Washington, Berlin and other points as initial meridians for counting longitude and the gradual agreement of all geographers in the use of longitudes from Greenwich. There is no reason why Greenwich should not also be used as the origin for counting time. Our division of the day into twenty-four hours has been made by man for his own convenience and our method of keeping time, by means of watches and clocks, is also an artificial and highly civilized method. We no longer use sundials, or compare our watches with sundials and noon marks, but we go to the nearest telegraph station and compare with the standards kept by the astronomers in their observatories. There is no particular reason why any one should be compelled to change his time reckoning by just one hour when he crosses some arbitrary dividing line between two regions where different standards are used. There is no good reason why one should cable to and fro, on business, between Washington and China or the Phillipines, or Australia, and then stop every minute to figure out whether it is yesterday or to-day. We are inclined to believe that for business purposes, as well as for scientific use, Greenwich time, the Greenwich date, and the Greenwich hour, counted from 0 to 24, will be found most convenient. This globe is but a small one, and in proportion as we conquer it and come to look at it, its atmosphere and its people from a broader point of view we shall need to consider the subject of time and time reckoning from a similar point of view. Absolute uniformity of watches throughout the world would be a convenience comparable with uniformity of weights and measures, coins and language.

THE FREQUENCY OF HAIL IN THE UNITED STATES.

In the MONTHLY WEATHER REVIEW for December, 1898, page 546, the reader will find a tabular statement of the total number of days on which hail was reported in each State by our observers, both regular and voluntary, during the five years, 1893–1897. If these numbers be divided by five we obtain the annual number of reports from each State; but as the States have different areas, we do not get a rational comparison of the relative frequency unless we divide these annual numbers by the areas of the States expressed in some uniform unit, such as 10,000 square miles, or 100 miles square, or a circle of 58 miles in radius.

These numbers relate principally to the ordinary slight hailstorms, hence the frequency of destructive hail is far less;

therefore one must make a very considerable reduction in order to determine whether it is worth while to go to any great expense in efforts to prevent local hailstorms. The following table is derived from that above referred to, recalling that the column headed "annual" on that page should read "total for five years."

States.	Areas.	Annual frequency.		States.	Areas.	Annual frequency.	
		By States.	By unit area.			By States.	By unit area.
Alabama	5.1	19 6	3.96	Montana	14.4	25.6	1.78
Arizona	11.4	22.6	1.99	Nebraska	7 6	43.8	5.78
Arkansas	5.2	26.4	5.08	Nevada	11.2	29.2	2.62
California	15.8	40.2	2.54	New Hampshire	0.9	9.6	10.68
Colorado	10.4	61.4	5.92	New Jersey	0.8	17.8	....
Connecticut	0.5	10.8	....	New Mexico	12.1	24.0	1.98
Delaware	0.2	3.8	....	New York	4.7	29.6	6 30
Dist. of Columbia	0.01	1.4	....	North Carolina	5.1	26.6	5.22
Florida	5.9	12.0	2.10	North Dakota	7.5	28.6	3.82
Georgia	5.8	19.6	3.39	Ohio	4.0	43.0	10 74
Idaho	8 1	34.4	4.26	Oklahoma	3 9	14.6	3.74
Illinois	5 5	46.4	8.44	Oregon	9.5	40.8	4.30
Indiana	3.4	33.4	9 84	Pennsylvania	4.6	28.4	6.18
Indian Territory	3.1	7.8	2.58	Rhode Island	0.1	2.0	......
Iowa	5.5	46.4	8.44	South Carolina	3.4	19.4	5.72
Kansas	8.1	50.8	6.28	South Dakota	7.6	30.8	4 06
Kentucky	3.8	27.2	7.16	Tennessee	4.6	26.2	5.70
Louisiana	4.1	20 6	5.04	Texas	27.4	39.6	1.44
Maine	3.5	6 4	1.84	Utah	8.4	12.8	3.06
Maryland	1.1	19.4	....	Vermont	1.0	6.4	6.40
Massachusetts	0.8	16.2	....	Virginia	6.1	20.4	3 36
Michigan	5 6	31.6	5.64	Washington	7.0	34.8	4 96
Minnesota	8.4	37.6	4.48	West Virginia	2.3	18.2	7.94
Mississippi	4.7	21.6	4.62	Wisconsin	5.3	33.2	6.28
Missouri	6.5	57.0	8.78	Wyoming	9.8	11.2	1.16

In the above table we have left the last column blank in the case of seven small States that ought to be grouped together as one Middle Atlantic Coast region, and these are thus combined in the following table:

States.	Areas.	Frequency by unit area.	Annual by States.
District of Columbia	0.01	1.4	140
Maryland	1.1	19.4	18
Delaware	0.2	3.8	19
New Jersey	0.8	17.8	22
Connecticut	0.5	10.8	22
Rhode Island	0.1	2.0	20
Massachusetts	0.8	16.2	20
Total	3.5	71.4	20.4

The above figures are but a crude approximation to the desired statistics as to frequency and area of distinctive hailstorms, and we hope that those who have reliable records of hail will favor us with details of the local records during the past thirty years.

THE CROP AS DEPENDING ON METEOROLOGICAL CONDITIONS.

It is well known that the tree or vine accumulates from year to year a greater or less surplus of material and cellular structure for use in flowering and fruiting. The crop does not depend simply on the weather of the current year, but also on the conditions during the one or two or even more years previous. The line of thought suggested in the following note by Mr. Howard Shriver, of Cumberland, Md., seems to be quite worthy of general consideration; it is copied from the August report of the West Virginia section:

During the spring of 1896, each successive week's account put the fruit crop worse than the preceding. No complaints were made; the bloom was abundant, the season propitious to an extraordinary degree, both as regards rain, sunshine, and absence of frost. Hence much was expected, yet the bloom mostly fell; the scanty crop of fruit still left, also lost, in large proportion, by falling off. People are slowly coming to realize that the fair promise of a luxuriant crop is not fulfilled.

There being no cause, during the winter of 1895-96 and spring of 1896, for this failure, we naturally revert to the consideration of the status of the tree during the time of bud formation. What was it? All remember the drought and excessive heat of the summer and fall of 1895, when vegetable nature succumbed. The more tender plants sunk under a heat protracted during the driest season we have ever ever had. Even stronger plants and trees drooped during the day, and recuperated little at night; during the critical period when they should have been at their best, under the tropical conditions of unusual warmth and moisture, instead, we had excessive warmth and no moisture. It was remarked the following summer that the ground was dry at the depth of a couple of feet, not having recovered its normal moisture after considerable rain. It is remembered how all our springs gave out, how the water in wells diminished, and how the creek and river dried up. Under these Sahara-like conditions the tree was expected to develop a bud, the embryo of the fruit of the following spring.

A close observer must have been impressed, during the heated term, with the difficulty, if not impossibility, of the trees forming a perfect bud under such conditions, and that either the bud of the following spring would not be formed sufficiently well to open, or that having opened it would fall or else be succeeded by a weakly fruit that would fall for want of inherent power to secure full development. The decimation of the fruit crop of that spring must, probably, be attributed to the cause above assigned.

According to my observation, the crop of indigenous flowers in this vicinity was very light. The many lovers of epigaeo (trailing arbutus) are well aware how short the crop was. It has been suggested that fire and ruthless gatherers who tear up stem and root as well as flower conspire to exterminate this favorite plant; this may be. But the bloom itself that year was not only scant, but not so perfectly formed as usual. One of our mountain ramblers who is also a lover of flowers, agreed with me in attributing the defect in abundance as well as beauty of the flower that year to the heat and drought of the previous year.

METEOROLOGICAL REPORT FROM NOME, ALASKA, SEPTEMBER, 1900.

We cull the following extracts from the report of the voluntary observer of the Weather Bureau at Nome, Alaska, for September, 1900. This report left Nome about the first of October and was received in Washington, D. C., October 31, before the September REVIEW had gone to press. The monthly mean temperature for September was 39°; monthly maximum, 54° on the 23d; monthly minimum, 22°, on the 22d; the mean maximum was 46.7°; the mean minimum, 31.2° The temperature fell to the freezing point or below on eighteen days. The total rainfall was 7.00 inches, and rain fell on seventeen days. Rain fell almost continuously from the 2d to the 16th. The winds during this spell of rainy weather were from a southerly quarter except on the 8th and 9th, when they shifted to the north and west. From the 17th to the 22d northerly winds and clear weather prevailed; on the 23d the winds were east with cloudy weather, and rain fell on the two succeeding days, with north and northeast winds. The remainder of the month was clear, except the 30th when a southeast gale prevailed with considerable rain. Gales were also reported on the 7th, 12th, 13th, and 15th. The observer remarks: "Frosts have been quite severe on several occasions and there were snow flurries on a few days.

THE WEATHER OF THE MONTH.

By ALFRED J. HENRY, Professor of Meteorology.

CHARACTERISTICS OF THE WEATHER FOR SEPTEMBER.

Aside from the West Indian hurricane which partially destroyed Galveston, Tex., on the 8th, an account of which will be found on another page of this REVIEW, there were few broad features of especial significance. Perhaps the most significant was the high pressure that prevailed on the middle and south Atlantic coasts and over Virginia, West Virginia, and the Ohio Valley. The weather east of the Rocky Mountains, at least, if not over the entire country, is controlled largely by the distribution of pressure over the Atlantic coast districts. When areas of high pressure persist over those districts areas of low pressure which develop in Alberta or over the northeastern Rocky Mountain slope and move southeastward into the Missouri Valley are forced to move thence a little east of north, passing over Minnesota and Lake Superior and thence eastward generally beyond the field of observation. The effect of the pressure distribution in such cases is to give heavy rains in the British Northwest, Minnesota, and the Lake Superior region, and high temperature with scant rains in the Mississippi Valley, the Lake region south of Superior, and generally eastward to the Atlantic. The fall of rain in the South Atlantic States is also markedly deficient, while far to the westward in Oklahoma, Indian Territory, west Texas, and New Mexico the rainfall is abundant. These conditions prevailed, in great measure, during the current month.

The temperature was abnormally high in eastern districts until about the 12th. The rapid movement of the West Indian hurricane from Iowa to the Canadian Maritime Provinces, on the 11-12th, brought a cessation of the high temperatures that had prevailed almost continuously since the early part of August, yet the month, as a whole, will rank as a warm September.

PRESSURE.

The distribution of monthly mean pressure is graphically shown on Chart IV, and the numerical values are given in Tables I and X.

As stated in the introduction, the South Atlantic high extended inland to the lakes, the region of greatest pressure being over North Carolina, Virginia, and West Virginia. West of the Mississippi River pressure was below normal, ranging from .01 to .05 inch. As compared with the preceding month, pressure rose in all regions except the immediate Pacific coast, the Gulf States, and Florida, the greatest increase being in the Northwest, where a maximum rise of .16 inch was recorded. This increase was, however, simply a recovery from the prevailing low pressure which existed in that region during August.

TEMPERATURE OF THE AIR.

Temperature was above the normal over practically the whole country from the Rocky Mountains eastward to the Atlantic. The region of greatest positive departure, however, extended from eastern Texas northeastward to eastern Pennsylvania. In this central region of greatest abnormality the average daily departure was about 6°.

West of the Rocky Mountains temperature was below normal, as during the preceding month.

Maximum temperatures of 100° and over were registered at voluntary stations of the Weather Bureau in the western part of Virginia, in South Carolina, Louisiana, and quite generally throughout eastern Kansas, Oklahoma, and northern Texas. Temperatures below freezing were observed in northern Minnesota, in the Dakotas, and throughout the Rocky Mountain region, save in New Mexico, and also over the northern and middle Plateaus and northern New England.

The distribution of monthly mean surface temperature, as deduced from the records of about 1,000 stations, is shown on Chart VI.

The average temperature for the several geographic districts and the departures from normal values are shown in the following table:

Average temperatures and departures from the normal.

Districts.	Number of stations.	Average temperatures for the current month.	Departures for the current month.	Accumulated departures since January 1.	Average departures since January 1.
		°	°	°	°
New England	10	63.1	+ 2.3	+ 8.0	+ 0.9
Middle Atlantic	12	71.8	+ 4.8	+13.3	+ 1.5
South Atlantic	10	77.8	+ 3.8	+ 4.6	+ 0.5
Florida Peninsula	7	80.7	+ 2.1	− 3.2	− 0.4
East Gulf	7	80.0	+ 4.0	− 2.4	− 0.3
West Gulf	7	81.1	+ 5.1	+ 6.8	+ 0.8
Ohio Valley and Tennessee	12	74.2	+ 5.7	+ 8.6	+ 1.0
Lower Lake	8	66.8	+ 3.6	+ 6.7	+ 0.7
Upper Lake	9	61.9	+ 2.9	+13.2	+ 1.5
North Dakota	8	56.1	− 1.6	+34.8	+ 3.9
Upper Mississippi Valley	11	67.5	+ 2.6	+14.7	+ 1.6
Missouri Valley	10	66.3	+ 1.2	+23.1	+ 2.6
Northern Slope	7	57.1	− 1.0	+29.8	+ 3.3
Middle Slope	6	68.6	+ 1.3	+17.6	+ 2.0
Southern Slope	6	74.2	+ 2.7	+ 6.9	+ 0.8
Southern Plateau	15	65.2	− 3.4	+ 4.4	+ 0.5
Middle Plateau	9	57.9	− 3.7	+14.1	+ 1.6
Northern Plateau	10	55.8	− 1.4	+22.0	+ 2.4
North Pacific	9	57.2	− 0.3	+12.2	+ 1.4
Middle Pacific	5	63.1	− 0.0	+ 7.8	+ 0.9
South Pacific	4	66.6	− 1.7	+ 7.3	+ 0.8

In Canada.—Prof. R. F. Stupart says:

Temperature was just above average in British Columbia, Quebec, and the Maritime Provinces, below average in Alberta and Assiniboia, a little above average in Saskatchewan and Manitoba, and considerably above in Ontario. Toronto was 6° above average, the warmest September but one (1881) since records have been kept, which is from 1840. Ontario stations were all from 3° to 6° above average, consequently it is fair to assume that this has been the second warmest September during the last sixty years. Alberta was 4° below average, which is remarkable when it is considered that Saskatchewan was actually above average.

PRECIPITATION.

There was a marked excess of rain from central Texas northward to the British Possessions. The fall in central and northern Texas, Oklahoma, Kansas, Minnesota, and northern Wisconsin was remarkably heavy. Over the greater part of this region the average excess was from 4 to 6 inches. Rain was also in excess of the normal locally in New England, eastern Pennsylvania, and in the Appalachian region from southern Pennsylvania to eastern Tennessee. On the north Pacific coast rainfall was from 2 to 4 inches less than

the seasonal average, and there was also a deficiency throughout California and Nevada. Rainfall was also markedly deficient along the Atlantic coast from New Jersey to Florida. This was to be expected, since the distribution of pressure was unfavorable to precipitation.

Traces of snow were recorded in western Nebraska, and at a few places in North Dakota. In the mountain region of Colorado and thence northward to the British Possessions varying amounts of snow were recorded, 14 inches being the greatest. Snow also fell in Nevada and Utah, but there was very little recorded in the mountainous regions of Idaho.

Average precipitation and departure from the normal.

Districts.	Number of stations.	Average.		Departure.	
		Current month.	Percentage of normal.	Current month.	Accumulated since Jan. 1.
		Inches.		Inches.	Inches.
New England	10	2.63	84	−0.5	− 2.5
Middle Atlantic	12	2.80	74	−1.0	− 6.4
South Atlantic	10	2.47	47	−2.8	− 8.3
Florida Peninsula	7	6.02	81	−1.4	+ 1.7
East Gulf	7	4.22	100	0.0	+ 7.7
West Gulf	7	2.84	70	−1.2	+ 2.8
Ohio Valley and Tennessee	12	1.94	66	−1.0	− 7.6
Lower Lake	8	1.93	66	−1.0	− 1.4
Upper Lake	9	4.18	120	+0.7	− 1.5
North Dakota	8	3.72	305	+2.5	+ 1.6
Upper Mississippi Valley	11	4.78	146	+1.5	− 0.4
Missouri Valley	10	4.00	167	+1.6	+ 1.8
Northern Slope	7	1.74	185	+0.8	− 0.8
Middle Slope	6	3.68	219	+2.0	+ 0.7
Southern Slope	6	7.56	350	+5.4	+ 7.9
Southern Plateau	15	1.73	186	+0.8	− 1.0
Middle Plateau	9	0.90	112	+0.1	− 3.2
Northern Plateau	10	1.27	109	+0.1	− 2.2
North Pacific	9	1.81	56	−1.4	− 1.7
Middle Pacific	5	0.36	55	−0.3	− 4.6
South Pacific	4	0.04	29	−0.1	− 4.3

In Canada.—Professor Stupart says:

Precipitation was below average in Ontario south and west of Lake Simcoe, except locally in the Niagara Peninsula, the deficiency being very generally from an inch to an inch and a half. In New Brunswick it was also for the most part below, St. John being as much as an inch below. The greater portion of British Columbia was also below average, many localities giving over an inch. Elsewhere throughout the Dominion it was above the average. The abnormally heavy precipitation in the Territories and Manitoba was most remarkable; at Edmonton the normal was exceeded by 4 inches, at Calgary by 3 inches, and at Winnipeg by nearly 2.5 inches. Several heavy falls of snow occurred in the Territories, which is also very unusual so early in the season. At Ottawa the rainfall was 1.5 inches above the average, at Father Point it was 2 inches above, and at Halifax 1.3 inches above.

HAIL

The following are the dates on which hail fell in the respective States:

Arizona, 21, 23, 30. California, 2, 13. Colorado, 8, 9, 11, 21, 24, 25. Idaho, 15, 23. Illinois, 15, 26. Iowa, 13, 14, 16, 25. Kansas, 14. Missouri, 2, 14, 15, 18, 22. Nebraska, 6, 14, 18, 22, 27. Nevada, 3, 17, 23, 24. New Mexico, 8, 12, 18. New York, 3. North Dakota, 13, 14, 18. Ohio, 26. Oregon, 5, 7, 15. South Dakota, 1, 11, 14, 18. Tennessee, 16. Texas, 20. Washington, 7, 22, 30. Wyoming, 3, 5, 9, 10, 21.

SLEET.

The following are the dates on which sleet fell in the respective States:

Arizona, 23. Colorado, 25, 27. Michigan, 16. Nevada, 23, 24. North Dakota, 25, 26.

HUMIDITY.

The averages by districts appear in the subjoined table:

Average relative humidity and departures from the normal.

Districts.	Average.	Departure from the normal.	Districts.	Average.	Departure from the normal.
	%			%	
New England	81	− 1	Missouri Valley	73	+ 6
Middle Atlantic	76	− 1	Northern Slope	65	+12
South Atlantic	78	− 3	Middle Slope	66	+ 8
Florida Peninsula	82	0	Southern Slope	72	+10
East Gulf	75	− 2	Southern Plateau	39	− 8
West Gulf	80	+ 6	Middle Plateau	40	+ 3
Ohio Valley and Tennessee	71	− 2	Northern Plateau	56	+ 4
Lower Lake	72	− 2	North Pacific Coast	78	− 3
Upper Lake	82	+ 6	Middle Pacific Coast	64	− 4
North Dakota	79	+14	South Pacific Coast	60	− 5
Upper Mississippi	76	+ 4			

SUNSHINE AND CLOUDINESS.

The distribution of sunshine is graphically shown on Chart VII, and the numerical values of average daylight cloudiness, both for individual stations and by geographical districts, appear in Table I.

The averages for the various districts, with departures from the normal, are shown in the table below:

Average cloudiness and departures from the normal.

Districts.	Average.	Departure from the normal.	Districts.	Average.	Departure from the normal.
New England	5.0	0.0	Missouri Valley	4.7	+0.7
Middle Atlantic	4.5	−0.3	Northern Slope	4.6	+0.6
South Atlantic	3.1	−1.7	Middle Slope	4.7	+1.5
Florida Peninsula	5.1	−0.4	Southern Slope	4.5	+0.9
East Gulf	3.1	−1.3	Southern Plateau	3.0	+0.7
West Gulf	4.6	+0.3	Middle Plateau	3.4	+0.9
Ohio Valley and Tennessee	4.4	0.0	Northern Plateau	4.6	+0.5
Lower Lake	5.0	+0.2	North Pacific Coast	5.2	+0.3
Upper Lake	5.7	+0.6	Middle Pacific Coast	3.4	+0.6
North Dakota	5.5	+1.2	South Pacific Coast	2.2	−0.3
Upper Mississippi	4.8	+0.6			

WIND.

The maximum wind velocity at each Weather Bureau station for a period of five minutes is given in Table I, which also gives the altitude of Weather Bureau anemometers above ground.

Following are the velocities of 50 miles and over per hour registered during the month:

Maximum wind velocities.

Stations.	Date.	Velocity.	Direction.	Stations.	Date.	Velocity.	Direction.
Amarillo, Tex	24	50	s.	Lincoln, Nebr	11	56	n.
Boston, Mass	12	52	w.	Mount Tamalpais, Cal.	5	51	nw.
Buffalo, N. Y	12	78	w.	Do	15	67	nw.
Chicago, Ill	2	53	s.	Do.	21	52	n.
Do.	11	72	sw.	Do.	23	62	nw.
Cleveland, Ohio	12	60	sw.	Do.	24	56	nw.
El Paso, Tex	21	50	nw.	New York, N. Y	12	65	nw.
Do.	23	51	nw.	Point Reyes Light, Cal.	23	72	nw.
Fort Worth, Tex	9	52	se.	Sioux City, Iowa	14	70	se.
Galveston, Tex	8	84*	ne.	Yankton, S. Dak	14	54	s.

*The anemometer cups were blown away at 5:30 p. m., at which time the wind was blowing at 84 miles per hour. It is estimated that later the wind attained a velocity of 120 miles per hour from the southeast.

ATMOSPHERIC ELECTRICITY.

Numerical statistics relative to auroras and thunderstorms are given in Table VII, which shows the number of stations from which meteorological reports were received, and the

number of such stations reporting thunderstorms (T) and auroras (A) in each State and on each day of the month, respectively.

Thunderstorms.—Reports of 2,563 thunderstorm were received during the current month as against 2,203 in 1899 and 5,736 during the preceding month.

The dates on which the number of reports of thunderstorms for the whole country were most numerous were: 2d, 192; 1st, 152; 3d, 142; 26th, 137.

Reports were most numerous from: Missouri, 243; Illinois, 177; New York, 126; Iowa, 123.

Auroras.—The evenings on which bright moonlight must have interfered with observations of faint auroras are assumed to be the four preceding and following the date of full moon, viz, 4th to 13th.

In Canada.—Auroras were reported as follows: Father Point, 18th, 19th, 28th; Minnedosa, 4th, 16th, 27th, 28th, 30th.

Thunderstorms were reported as follows: Yarmouth, 17th, 18th; Charlottetown, 12th, 22d; Father Point, 27th; Quebec, 3d, 21st, 26th; Montreal, 3d, 6th; Bissett, 16th, 21st; Ottawa, 16th, 21st, 26th, 27th; Kingston, 6th, 16th, 21st, 26th; Toronto, 3d, 6th, 11th, 15th, 16th, 21st, 26th; White River, 2d, 3d, 15th, 25th; Saugeen, 11th, 21st; Parry Sound, 6th, 11th, 12th, 16th, 20th; Port Arthur, 1st, 2d, 4th, 5th; Winnipeg, 22d; Minnedosa, 24th; Qu'Appelle, 9th; Swift Current, 8th, 9th; Hamilton, 18th, 24th, 29th, 30th.

ERRATA.

June REVIEW, 1900, page 243, "Observations at Honolulu," line 18, for "has always been," read "is." Page 250, line 20 from bottom, for "Upsala," read "Christiania." Page 251, column 1, lines 11 and 12 from bottom, for "he" and "ower," read "the" and "lower."

In the article "Forecasting for the Farmer," July, 1900, REVIEW, page 288, first column, fourth paragraph, first line should read "While drying weather is most hoped for," instead of "While drying weather is not hoped for."

DESCRIPTION OF TABLES AND CHARTS.

By ALFRED J. HENRY, Professor of Meteorology.

Table I gives, for about 145 Weather Bureau stations making two observations daily and for about 25 others making only one observation, the data ordinarily needed for climatological studies, viz, the monthly mean pressure, the monthly means and extremes of temperature, the average conditions as to moisture, cloudiness, movement of the wind, and the departures from normals in the case of pressure, temperature, and precipitation, the total depth of snowfall, and the mean wet-bulb temperatures. The altitudes of the instruments above ground are also given.

Table II gives, for about 2,700 stations occupied by voluntary observers, the highest maximum and the lowest minimum temperatures, the mean temperature deduced from the average of all the daily maxima and minima, or other readings, as indicated by the numeral following the name of the station; the total monthly precipitation, and the total depth in inches of any snow that may have fallen. When the spaces in the snow column are left blank it indicates that no snow has fallen, but when it is possible that there may have been snow of which no record has been made, that fact is indicated by leaders, thus (....).

Table III gives, for 44 stations selected out of 144 that maintain continuous records, the mean hourly temperatures deduced from the Richard thermographs described and figured in the Report of the Chief of the Weather Bureau, 1891–92, p. 29.

Table IV gives, for 44 stations selected out of 142 that maintain continuous records, the mean hourly pressures as automatically registered by Richard barographs, except for Washington, D. C., where Foreman's barograph is in use. Both instruments are described in the Report of the Chief of the Weather Bureau, 1891–92, pp. 26 and 30.

Table V gives, for about 157 stations, the arithmetical means of the hourly movements of the wind ending with the respective hours, as registered automatically by the Robinson anemometer, in conjunction with an electrical recording mechanism, described and illustrated in the Report of the Chief of the Weather Bureau, 1891–92, p. 19.

Table VI gives, for all stations that make observations at 8 a. m. and 8 p. m., the four component directions and the resultant directions based on these two observations only and without considering the velocity of the wind The total movement for the whole month, as read from the dial of the Robinson anemometer, is given for each station in Table I. By adding the four components for the stations comprised in any geographical division the average resultant direction for that division can be obtained.

Table VII gives the total number of stations in each State from which meteorological reports of any kind have been received, and the number of such stations reporting thunderstorms (T) and auroras (A) on each day of the current month.

Table VIII gives, for about 95 stations, the average hourly sunshine (in percentages) as derived from the automatic records made by two essentially different types of instruments, designated, respectively, the thermometric recorder and the photographic recorder. The kind of instrument used at each station is indicated in the table by the letter T or P in the column following the name of the station.

Table IX gives a record of rains whose intensity at some period of the storm's continuance equaled or exceeded the following rates:

Duration, minutes..	5	10	15	20	25	30	35	40	45	50	60	80	100	120
Rates pr. hr. (ins.)..	3.00	1.80	1.40	1.20	1.08	1.00	0.94	0.90	0.86	0.84	0.75	0.60	0.54	0.50

In the northern part of the United States, especially in the colder months of the year, rains of the intensities shown in the above table seldom occur. In all cases where no storm of sufficient intensity to entitle it to a place in the full table has occurred, the greatest rainfall of any single storm has been given, also the greatest hourly fall during that storm.

Table X gives, for about 30 stations furnished by the Canadian Meteorological Service, Prof. R. F. Stupart, director, the means of pressure and temperature, total precipitation and depth of snowfall, and the respective departures from normal values, except in the case of snowfall.

Table XI gives the heights of rivers referred to zeros of gages.

NOTES EXPLANATORY OF THE CHARTS.

Chart I, tracks of centers of high areas, and Chart II, tracks of centers of low areas, are constructed in the same way. The roman numerals show number and chronological order of highs (Chart I) and lows (Chart II). The figures

within the circles show the days of the month; the letters *a* and *p* indicate, respectively, the 8 a. m. and 8 p. m., seventy-fifth meridian time, observations. Within each circle is also given (Chart I) the highest barometric reading and (Chart II) the lowest pressure at or near the center at that time.

Chart III.—Total precipitation. The scale of shades showing the depth of rainfall is given on the chart itself. For isolated stations the rainfall is given in inches and tenths, when appreciable; otherwise, a "trace" is indicated by a capital T, and no rain at all, by 0.0.

Chart IV.—Sea-level pressure, temperature, and resultant surface winds. The wind directions on this Chart are the computed resultants of observations at 8 a. m. and 8 p. m., daily; the resultant duration is shown by figures attached to each arrow. The temperatures are the means of daily maxima and minima and are reduced to sea level. The pressures are the means of 8 a. m. and 8 p. m. observations, daily, and are reduced to sea level and to standard gravity. The reduction for 30 inches of the mercurial barometer, as formerly shown by the marginal figures for each degree of latitude, has already been applied.

Chart V.—Hydrographs for seven principal rivers of the United States.

Chart VI.—Surface temperatures; maximum, minimum, and mean. Lines of equal monthly mean temperature in red; lines of equal maximum temperature in black; and lines of equal minimum temperature (dotted) also in black.

Chart VII.—Percentage of sunshine. The average cloudiness at each Weather Bureau station is determined by numerous personal observations during the day. The difference between the observed cloudiness and 100, it is assumed, represents the percentage of sunshine, and the values thus obtained have been used in preparing Chart VII.

Chart VIII.—Sea-level pressure, temperature, and resultant surface winds for West Indian stations, constructed as for Chart IV.

Charts IX to XIII.—Galveston hurricane, September 6–9, 1900.

TABLE 1.—*Climatological data for Weather Bureau Stations, September, 1900.*

Stations.	Elevation of instruments: Barometer above sea level, feet.	Elevation: Thermometers above ground.	Elevation: Anemometer above ground.	Pressure, in inches: Mean actual, 8 a. m. + 8 p. m. ÷ 2.	Pressure: Mean reduced.	Pressure: Departure from normal.	Temperature of the air, in degrees Fahrenheit: Mean max. + mean min. ÷ 2.	Temperature: Departure from normal.	Temperature: Maximum.	Temperature: Date.	Temperature: Mean maximum.	Temperature: Minimum.	Temperature: Date.	Temperature: Mean minimum.	Temperature: Greatest daily range.	Mean wet thermometer.	Mean temperature of the dew-point.	Mean relative humidity, per cent.	Precipitation, in inches: Total.	Precipitation: Departure from normal.	Precipitation: Days with .01, or more.	Wind: Total movement, miles.	Wind: Prevailing direction.	Wind: Maximum velocity: Miles per hour.	Wind: Maximum velocity: Direction.	Wind: Maximum velocity: Date.	Clear days.	Partly cloudy days.	Cloudy days.	Average cloudiness, tenths.	Total snowfall.
New England.							63.1	+ 2.3										81	2.63	− 0.5										5.0	
Eastport	76	69	74	29.96	30.04	+ .01	57.4	+ 1.6	82	4	64	41	19	51	26	53	52	86	1.52	− 1.7	6	6,329	sw.	48	nw.	12	13	6	11	5.6	
Portland, Me	103	81	89	29.93	30.03	− .02	61.4	+ 1.7	87	6	69	41	19	53	30	56	53	78	2.56	− 0.5	10	4,604	s.	29	nw.	12	15	8	7	4.5	
Northfield	876	15	65	29.14	30.07	.00	57.9	+ 1.9	89	3	70	29	19	46	39	54	51	83	2.59	− 0.2	11	5,450	s.	41	sw.	12	5	13	12	6.4	
Boston	125	115	181	29.93	30.07	+ .01	65.0	+ 2.6	91	6	72	44	19	58	26	60	56	77	4.62	+ 1.7	7	6,871	sw.	52	w.	12	12	10	8	4.8	
Nantucket	12	43	54	30.06	30.07	− .01	64.6	+ 1.9	82	4	70	47	20	59	17	61	59	83	2.59	− 0.7	4	6,967	sw.	48	n.	18	9	10	11	5.9	
Block Island	26	11	70	30.05	30.08	+ .01	66.2	+ 2.6	82	12	72	50	18	61	23	62	59	81	2.26	− 0.6	5	9,930	sw.	45	nw.	18	14	11	5	3.7	
Narragansett	......	10	....	......	......	......	65.2	+ 3.0	86	12	73	44	19	57	31	....	....	....	2.79	− 0.4	6	......	se.	....	......	....	20	4	6	....	
New Haven	106	117	140	29.96	30.07	− .01	66.8	+ 3.3	89	6	76	43	20	58	28	62	59	79	2.10	− 1.6	7	5,829	sw.	42	w.	12	16	11	3	3.8	
Mid. Atlan. States.							71.2	+ 4.8										76	2.80	− 1.0										4.5	
Albany	97	84	118	29.97	30.08	+ .02	67.6	+ 4.5	91	3	77	40	19	58	27	59	55	70	0.74	− 2.7	7	5,115	s.	34	sw.	12	9	12	9	5.4	
Binghamton	875	79	90	......	......	......	65.0	+ 4.0	92	11	77	31	19	53	37	....	....	....	2.10	− 1.2	8	3,903	n.	42	n.	6	10	7	13	5.9	
New York	314	108	346	29.75	30.08	.00	70.8	+ 4.9	90	6	77	53	18	65	18	63	59	72	2.36	− 1.4	5	8,630	nw.	65	w.	12	11	12	7	4.9	
Harrisburg	374	94	104	......	......	......	70.8	+ 6.4	92	11	79	44	19	62	29	....	....	....	1.41	− 2.7	6	3,839	ne.	31	w.	12	11	10	9	5.0	
Philadelphia	117	168	184	29.97	30.09	.00	72.4	+ 5.3	90	6	80	50	19	65	25	64	60	72	6.31	+ 3.0	5	6,023	nw.	33	nw.	18	14	7	9	4.6	
Scranton	805	111	119	......	......	......	67.2	......	91	11	78	35	19	56	35	....	....	....	1.72	......	11	4,514	ne.	38	w.	12	11	12	7	5.0	
Atlantic City	52	68	76	30.04	30.09	+ .08	70.2	+ 3.5	88	12	75	49	19	65	21	66	64	81	1.42	− 2.1	9	6,658	sw.	36	sw.	16	11	13	6	4.4	
Cape May	17	47	51	30.08	30.10	+ .08	71.9	+ 3.8	88	12	77	49	19	67	17	66	....	....	1.31	− 2.6	5	5,009	s.	27	nw.	17	11	14	5	4.5	
Baltimore	123	68	82	29.95	30.08	.00	73.8	+ 5.9	95	11	82	50	19	66	27	69	68	85	4.26	+ 0.4	7	3,176	se.	20	w.	12	11	10	9	5.1	
Washington	112	59	76	29.97	30.08	− .01	73.6	+ 5.8	97	11	83	45	19	64	29	66	63	76	4.61	+ 0.9	8	3,768	s.	30	nw.	12	15	9	6	4.2	
Cape Henry	......	5	34	......	......	......	75.4	+ 3.6	99	11	83	57	20	68	27	....	....	....	2.44	− 2.1	6	7,456	s.	40	nw.	17	19	6	5	3.3	
Lynchburg	681	83	88	29.38	30.09	+ .02	74.2	+ 5.2	98	9	85	50	19	63	31	65	61	72	4.78	+ 1.0	8	2,054	se.	23	nw.	15	16	10	4	3.6	
Norfolk	91	102	111	30.00	30.10	+ .08	76.0	+ 4.9	98	10	84	57	19	67	25	69	66	80	1.92	− 2.6	7	5,135	se.	37	nw.	16	21	5	4	3.2	
Richmond	144	82	90	......	......	......	75.6	......	98	9	86	52	19	66	27	....	....	....	4.08	......	7	3,081	s.	17	sw.	12	17	8	5	4.1	
S. Atlantic States.							77.3	+ 3.8										73	2.47	− 2.8										3.1	
Charlotte	773	68	76	29.29	30.08	+ .02	76.4	+ 5.3	95	10	87	52	18	66	27	66	62	66	0.73	− 2.6	5	3,538	ne.	21	s.	13	23	4	3	2.5	
Hatteras	11	17	86	30.09	30.10	+ .06	77.2	+ 3.5	87	14	82	64	19	72	14	71	69	79	1.03	− 5.4	4	7,295	ne.	32	nw.	23	22	7	1	2.4	
Kittyhawk	8	12	30	......	......	......	75.2	+ 1.8	92	11	81	59	18	69	18	....	....	....	1.74	− 2.9	4	7,625	ne.	....	......	....	24	1	5	2.4	
Raleigh	376	98	101	29.72	30.10	+ .08	75.8	+ 5.3	96	12	86	52	18	66	26	68	64	74	2.13	− 1.1	6	2,887	s.	17	ne.	27	20	9	1	2.7	
Wilmington	78	82	90	30.02	30.10	+ .06	76.6	+ 3.0	94	13	86	56	19	67	26	70	68	82	2.38	− 4.0	6	4,644	ne.	27	sw.	15	20	9	1	2.6	
Charleston	48	14	92	30.05	30.10	+ .07	79.6	+ 3.6	93	17	85	64	18	74	21	73	70	78	2.34	− 4.2	8	7,693	e.	36	e.	6	14	14	2	3.9	
Columbia	......	5	....	......	......	......	79.0	+ 5.2	100	13	90	55	19	68	32	....	....	....	3.29	− 0.8	5	......	se.	....	......	....	23	3	4	3.1	
Augusta	180	89	108	29.89	30.08	+ .06	78.9	+ 4.5	95	12	89	55	18	69	29	70	68	76	2.32	− 1.6	5	3,365	s.	28	sw.	13	22	5	3	2.5	
Savannah	65	79	89	30.01	30.07	+ .04	79.3	+ 3.5	96	28	87	63	19	71	24	74	72	86	4.39	− 1.7	11	4,822	e.	30	sw.	15	15	12	3	3.5	
Jacksonville	43	69	84	30.00	30.05	+ .06	80.4	+ 2.8	96	28	88	63	19	72	28	74	72	82	4.33	− 4.1	18	4,944	e.	24	se.	13	12	10	8	5.1	
Florida Peninsula.							81.4	+ 0.9										82	7.49	− 0.3										5.1	
Jupiter	28	13	80	29.95	29.98	+ .02	81.7	+ 2.1	92	18	87	73	29	77	15	77	75	82	7.62	− 2.1	13	8,734	ne.	48	e.	6	10	13	7	5.3	
Key West	22	43	50	29.92	29.94	.00	81.4	− 1.1	88	8	86	71	11	77	13	76	74	81	10.00	+ 2.6	15	6,941	e.	40	ne.	5	13	14	3	4.3	
Tampa	34	60	67	29.96	30.00	+ .02	81.2	+ 1.6	93	30	89	68	28	74	21	74	73	82	4.86	− 1.3	10	5,165	ne.	28	ne.	5	5	19	6	5.7	
East Gulf States.							80.0	+ 4.0										75	4.22	0.0										3.1	
Atlanta	1,174	139	156	28.88	30.08	+ .01	76.1	+ 4.6	94	12	85	50	18	67	24	67	64	72	3.62	− 0.1	4	6,219	e.	34	e.	1	18	8	4	3.8	
Macon	370	93	99	......	......	......	77.5	......	94	28	88	54	18	67	29	....	....	....	1.25	......	4	3,892	e.	22	ne.	1	17	11	2	2.9	
Pensacola	56	78	90	......	......	......	80.7	+ 3.2	95	16	88	66	19	74	19	....	....	....	3.18	− 1.6	7	7,438	ne.	36	se.	13	22	4	4	2.9	
Mobile	57	88	96	29.96	30.02	+ .03	80.2	+ 3.4	94	16	88	65	19	73	22	73	70	78	4.01	− 1.1	8	5,320	n.	36	s.	13	21	4	2	3.0	
Montgomery	223	100	112	29.81	30.04	+ .02	79.4	+ 3.8	95	28	89	58	19	70	27	71	67	72	4.43	+ 1.5	5	4,394	e.	24	e.	7	21	5	4	3.2	
Meridian	375	84	93	......	......	......	78.0	+ 5.0	93	16	88	58	18	68	27	....	....	....	2.48	− 0.9	4	3,621	ne.	26	ne.	14	19	9	2	3.3	
Vicksburg	247	65	73	29.74	30.00	− .02	80.8	+ 5.5	96	16	91	62	18	71	27	72	69	75	2.12	− 1.4	3	4,181	e.	24	e.	8	18	9	3	3.1	
New Orleans	51	112	120	29.94	30.00	+ .03	82.0	+ 3.7	96	16	89	71	14	75	19	74	72	77	3.76	− 0.8	9	6,498	se.	47	se.	8	24	4	2	2.5	
Port Eads	......	27	....	......	......	......	82.6	+ 2.8	95	17	88	73	*	77	15	77	....	....	10.13	+ 4.1	12	......	e.	58	e.	7	3	20	7	....	
West Gulf States.							81.1	+ 5.1										80	2.84	− 1.2										4.6	
Shreveport	249	77	84	29.73	29.99	− .02	81.8	+ 6.3	98	16	91	64	18	72	26	73	70	77	2.87	− 0.9	4	4,380	se.	28	se.	9	11	9	10	4.7	
Fort Smith	457	74	82	29.52	29.99	.00	77.9	+ 5.6	96	15	86	60	18	69	26	71	70	82	3.75	+ 0.2	11	5,391	e.	36	nw.	12	12	6	12	5.5	
Little Rock	357	98	100	29.65	30.02	− .01	78.2	+ 5.3	95	15	87	56	18	70	27	72	70	84	3.31	+ 0.2	10	3,796	ne.	36	se.	9	12	11	7	4.5	
Corpus Christi	18	42	50	29.91	29.98	− .04	82.2	+ 3.4	97	9	87	75	14	78	19	77	76	82	2.13	− 2.6	12	9,479	se.	30	se.	23	10	16	4	4.0	
Fort Worth	670	106	114	......	......	......	80.6	......	102	16	90	64	17	71	32	....	....	....	9.12	......	9	7,879	se.	52	se.	9	18	8	4	3.7	
Galveston	54	84	88	29.87	29.92	− .04	84.1	+ 4.6	94	15	89	73	4	79	15	77	75	78	3.07[a]	− 3.1	12	6,493	se.	†	se.	8	12	14	4	4.0	
Palestine	510	54	61	29.42[a]	29.95[a]	− .03	81.3[a]	+ 5.6	96[a]	14	90[a]	65[a]	21	72[a]	22	74[a]	72[a]	80[a]	3.77	+ 0.5	10	4,998	se.	30	ne.	8	14	8	8	4.5	
San Antonio	701	95	104	29.21	29.93	− .04	82.4	+ 4.9	97	15	93	68	28	72	28	72	69	75	0.97	− 2.4	5	5,476	se.	30	nw.	9	5	14	11	5.7	
Ohio Val. & Tenn.							74.2	+ 5.7										71	1.94	− 1.0										4.4	
Chattanooga	762	106	112	29.31	30.09	+ .03	76.6	+ 5.9	93	10	87	53	18	65	30	68	64	72	1.66	− 2.0	4	3,683	ne.	21	nw.	17	15	11	4	3.9	
Knoxville	1,004	10	98	29.07	30.10	+ .03	75.7	+ 6.4	95	10	86	48	18	66	36	67	64	77	3.41	+ 0.7	10	3,506	ne.	22	w.	29	19	6	5	3.1	
Memphis	397	140	154	29.64	30.05	+ .01	78.4	+ 6.3	94	5	87	54	18	70	26	70	67	76	2.73	− 0.4	8	5,863	ne.	36	nw.	12	11	12	7	4.8	
Nashville	546	128	134	29.52	30.08	+ .04	76.5	+ 5.8	95	7	86	50	18	67	28	68	65	73	4.55	+ 0.5	7	3,339	nw.	27	e.	1	17	6	7	4.0	
Lexington	989	75	102	......	......	......	73.2	+ 5.1	97	10	83	46	17	63	30	....	....	....	1.85	− 0.7	8	4,914	se.	27	sw.	11	11	15	4	4.5	
Louisville	525	114	136	29.53	30.08	+ .02	75.4	+ 6.0	99	8	86	47	18	65	27	66	62	71	1.05	− 1.8	5	4,517	n.	32	sw.	11	12	14	4	4.2	
Evansville	434	72	82	......	......	......	75.4	......	96	9	85	46	18	66	26	....	....	....	4.24	......	3	3,922	ne.	32	sw.	11	17	8	5	3.4	
Indianapolis	822	154	164	29.22	30.07	+ .02	70.8	+ 4.8	93	10	80	42	17	62	28	62	57	68	2.95	0.0	6	6,162	nw.	48	sw.	11	10	13	7	5.3	
Cincinnati	628	152	157	29.41	30.08	+ .03	73.6	+ 5.5	97	10	83	46	17	64	29	64	59	66	0.28	− 2.1	3	4,139	sw.	32	sw.	11	13	12	5	4.8	
Columbus	824	87	100	29.22	30.08	+ .04	71.2	+ 5.1	94	9	82	46	17	60	32	62	57	69	0.97	− 1.6	6	4,828	nw.	34	sw.	12	11	13	6	4.7	
Pittsburg	842	116	123	29.20	30.07	+ .04	72.2	+ 5.5	97	11	82	47	19	62	33	62	56	65	1.01	− 1.6	5	3,873	nw.	36	nw.	12	12	13	5	4.7	
Parkersburg	638	77	84	29.44	30.11	+ .01	72.6	+ 5.8	96	9	83	48	19	62	31	64	60	72	0.87	− 2.3	7	3,170	s.	29	nw.	11	10	15	5	4.5	
Elkins	1,940	41	50	......	......	......	67.0	......	92	1	80	36	19	51	43	....	....	....	2.56	......	10	2,118	nw.	27	w.	16	6	19	5	5.4	
Lower Lake Region.							66.3	+ 3.6										72	1.93	− 1.0										5.0	
Buffalo	767	178	206	29.25	30.06	+ .02	67.0	+ 4.9	95	1	75	45	19	59	32	60	55	68	2.90	− 0.4	7	9,239	sw.	78	w.	12	5	14	11	6.5	
Oswego	335	76	87	29.70	30.06	.00	64.0	+ 2.3	92	2	72	40	19	56	27	58	55	75	2.53	− 0.8	9	6,696	se.	45	w.	12	10	10	10	5.0	
Rochester	523	81	90	29.51	30.07	+ .03	66.0	+ 4.0	95	2	76	43	19	56	31	58	54	73	1.93	− 0.4	10	4,966	sw.	36	sw.	12	11	12	7	5.0	
Erie	713	92	102	29.32	30.07	+ .03	66.8	+ 3.2	92	2	74	46	17	60	25	60	56	70	1.97	− 2.0	7	7,136	s.	42	w.	12	12	14	4	4.6	
Cleveland	762	190	201	29.27	30.07	+ .01	67.0	+ 3.2	92	11	75	44	17	59	27	60	55	69	1.94	− 1.5	5	9,982	se.	60	sw.	12	11	11	8	4.8	
Sandusky	629	62	70	29.41	30.07	+ .03	68.4	+ 3.3	91	11	77	45	17	60	26	61	58	72	1.50	− 1.3	5	5,353	sw.	36	w.	12	7	12	11	6.0	
Toledo	628	123	128	29.41	30.07	+ .03	68.0	+ 4.1	92	6	77	42	18	60	28	60	56	72	0.82	− 1.6	5	6,470	sw.	44	sw.	11	19	7	4	3.9	
Detroit	730	160	166	29.28	30.05	.00	66.8	+ 3.9	92	6	75	41	18	58	27	60	57	76	1.88	− 0.6	9	6,538	sw.	43	sw.	11	10	15	5	4.6	
Upper Lake Region.							61.9	+ 2.9										83	4.13	+ 0.7										5.7	
Alpena	609	61	65	29.39	30.04	+ .03	60.9	+ 3.7	88	11	69	37	28	53	26	57	55	83	3.23	− 0.6	16	6,947	nw.	37	nw.	12	10	6	14	5.8	
Escanaba	612	43	57	29.35	30.00	+ .03	59.8	+ 3.1	79	5	68	39	27	52	23	55	54	84	5.82	+ 2.2	18	6,589	s.	35	n.	11	9	7	14	6.0	
Grand Haven	632	55	64	29.37	30.03	+ .01	63.2	+ 2.3	88	1	71	41	30	55	24	59	57	82	2.15	− 1.4	9	6,681	nw.	44	nw.	11	11	13	6	4.7	
Houghton	668	66	74	......	......	......	58.0	......	88	1	66	36	16	50	30	....	....	....	9.22	......	19	5,193	nw.	28	w.	2	6	10	14	6.6	
Marquette	734	67	95	29.21	29.94	− .05	58.7	+ 1.9	88	1	66	39	28	52	25	55	54	87	6.61	+ 2.7	19	7,773	nw.	38	n.	16	4	14	12	6.7	
Port Huron	638	70	108	29.29	30.08	+ .02	63.4	+ 4.2	88	1	74	42	18	56	28	58	55	77	1.32	− 1.3	11	7,312	s.	46	sw	11	12	14	4	4.5	
Sault Ste. Marie	614	40	61	29.34	29.99	− .02	58.7	+ 3.2	84	1	66	37	28	51	28	55	53	88	7.25	+ 2.8	18	5,368	s.	32	nw.	5	6	13	11	6.1	
Chicago	823	241	274	29.19	30.05	+ .02	65.6	+ 1.4	91	10	72	41	17	59	23	61	59	82	1.56	− 1.3	11	11,517	s.	72	sw.	11	8	17	5	4.8	
Milwaukee	681	124	142	29.33	30.04	+ .01	65.0	+ 3.8	91	10	73	43	17	56	29	58	55	77	3.51	+ 0.6	9	7,644	sw.	40	nw.	11	11	9	10	5.4	
Green Bay	617	49	57	29.37	30.03	− .01	63.5	+ 2.8	90	5	73	42	18	54	30	57	54	80	5.09	+ 2.0	14	5,818	s.	45	nw.	11	7	8	15	6.3	
Duluth	709	95	115	29.22	29.97	− .01	58.6	+ 2.4	83	5	66	36	27	51	23	54	50	79	4.80	+ 0.9	13	6,896	sw.	36	ne.	14	10	9	11	5.4	
North Dakota.							55.5	+ 0.8										79	3.26	+ 1.9										5.5	
Moorhead	935	54	60	28.96	29.97	+ .01	57.4	+ 0.9	90	1	67	31	17	47	37	52	49	79	3.28	+ 1.2	13	8,131	se.	36	se.	1	10	10	10	5.5	
Bismarck	1,674	16	29	28.22	29.98	+ .01	55.8	− 1.2	88	4	66	26	27	46	42	50	46	76	2.47	+ 3.1	10	3,095	nw.	42	se.	23	11	6	13	6.0	
Williston	1,875	15	31	27.99	29.96	+ .01	53.4	− 2.1	85	3	64	25	26	42	38	49	47	83	2.34	+ 1.4	10	7,607	n.	48	e.	14	12	12	6	4.9	

TABLE I.—*Climatological data for Weather Bureau Stations, September, 1900*—Continued.

Stations.	Elevation of instruments: Barometer above sea level, feet.	Thermometers above ground.	Anemometer above ground.	Pressure, in inches: Mean actual, 8 a. m. + 8 p. m. ÷ 2.	Mean reduced.	Departure from normal.	Temperature of the air, in degrees Fahrenheit: Mean max. + mean min. ÷ 2.	Departure from normal.	Maximum.	Date.	Mean maximum.	Minimum.	Date.	Mean minimum.	Greatest daily range.	Mean wet thermometer.	Mean temperature of the dew-point.	Mean relative humidity, per cent.	Precipitation, in inches: Total.	Departure from normal.	Days with .01, or more.	Wind: Total movement, miles.	Prevailing direction.	Maximum velocity: Miles per hour.	Direction.	Date.	Clear days.	Partly cloudy days.	Cloudy days.	Average cloudiness, tenths.	Total snowfall.
Upper Mis. Valley.							67.5	+ 2.6										76	4.73	+ 1.5										4.8	
Minneapolis	....	99	208	....	....	....	61.5	— 0.7	92	5	70	36	27	52	30	....	....	....	7.44	+ 4.9	12	7,618	nw.	34	se.	24	9	10	11	....	
St. Paul	837	114	124	29.06	30.02	+ .03	61.6	+ 1.8	91	5	70	37	27	54	26	55	52	76	9.39	+ 6.4	12	5,653	s.	28	s.	9	10	10	10	5.5	
La Crosse	714	70	78	....	....	....	63.4	+ 1.8	93	5	72	40	27	54	28	....	....	....	4.71	+ 0.5	14	4,944	s.	30	nw.	11	9	10	11	5.6	
Davenport	606	71	79	29.39	30.04	+ .01	66.9	+ 2.2	91	5	76	38	17	57	29	60	56	76	3.66	+ 0.5	13	5,054	se.	44	sw.	11	16	6	8	4.0	
Des Moines	861	84	88	29.12	30.04	+ .04	65.4	+ 1.3	92	5	76	40	17	55	31	60	58	82	3.66	+ 0.5	9	5,571	sw.	33	sw.	24	10	8	12	5.5	
Dubuque	698	101	109	29.30	30.04	+ .02	65.4	+ 2.2	92	5	75	38	18	56	31	58	54	74	3.34	— 0.8	12	5,300	se.	42	nw.	11	12	11	7	4.5	
Keokuk	614	63	78	29.39	30.04	+ .02	68.6	+ 2.2	92	*	78	42	17	59	29	61	57	75	5.02	+ 1.5	11	5,196	se.	46	w.	11	15	9	6	3.8	
Cairo	356	87	93	29.69	30.07	+ .04	75.8	+ 5.9	95	8	84	53	17	68	23	68	66	78	2.40	— 0.2	9	4,317	se.	30	sw.	11	8	14	8	5.4	
Springfield, Ill.	644	82	92	29.39	30.06	+ .02	69.6	+ 3.2	92	9	79	41	17	60	30	62	58	74	5.15	+ 2.0	11	5,930	s.	38	sw.	11	14	10	6	4.2	
Hannibal	534	75	110	....	....	....	70.2	+ 3.5	93	9	80	40	17	60	34	....	....	....	4.57	+ 2.1	11	5,976	sw.	48	s.	11	14	11	5	4.2	
St. Louis	567	111	210	29.46	30.05	+ .02	74.1	+ 4.7	95	9	83	49	17	66	25	66	63	75	2.68	— 0.4	9	6,077	s.	48	sw.	11	14	8	8	4.8	
Missouri Valley.							66.3	+ 1.2										73	4.00	+ 1.6										4.7	
Columbia	784	4	84	....	....	....	71.0	+ 2.5	93	6	81	43	17	61	30	....	....	....	3.14	— 0.5	10	5,280	se.	32	sw.	11	12	11	7	4.6	
Kansas City	963	78	95	29.02	30.02	+ .02	71.0	+ 3.5	94	6	80	46	27	62	26	63	59	73	7.38	+ 3.9	13	5,923	se.	34	sw.	11	10	7	13	5.4	
Springfield, Mo	1,324	100	103	28.65	30.02	+ .01	72.4	+ 4.7	90	6	80	49	17	65	21	66	65	83	5.48	+ 1.4	14	6,690	se.	33	n.	16	8	14	8	5.1	
Topeka	....	81	....	....	....	....	70.6	+ 1.9	95	8	80	45	29	61	33	....	....	....	7.47	+ 4.8	14	....	se.	....	....	....	9	15	6	4.8	
Lincoln	1,189	75	84	28.72	29.97	— .03	67.2	+ 1.1	97	5	77	42	17	57	36	59	56	73	1.92	0.0	7	7,745	se.	56	n.	11	13	10	7	4.6	
Omaha	1,105	115	121	28.82	29.98	— .02	66.8	+ 2.0	94	5	76	42	17	58	31	60	57	77	3.60	+ 0.7	8	5,710	se.	45	nw.	11	12	13	5	4.4	
Valentine	2,598	39	40	27.29	29.97	— .04	61.7	+ 0.1	95	7	73	29	26	50	41	52	46	64	0.86	— 0.1	8	8,405	s.	48	sw.	1	15	7	8	4.7	
Sioux City	1,135	96	164	....	....	....	62.8	— 2.4	92	8	74	35	17	52	35	....	....	....	5.64	+ 4.5	8	9,672	se.	70	se.	14	17	9	4	3.7	
Pierre	1,572	11	19	28.31	29.95	— .04	62.1	— 1.6	98	1	73	29	27	51	39	52	46	64	2.69	+ 1.7	11	9,546	se.	48	nw.	1	13	7	10	4.7	
Huron	1,306	56	67	28.58	29.97	— .03	60.0	— 0.1	91	9	72	26	27	48	45	53	49	74	2.39	+ 1.0	12	9,675	se.	48	se.	24	15	9	6	4.5	
Yankton	1,233	52	58	....	....	....	63.3	+ 1.2	97	8	75	31	27	52	40	....	....	....	3.43	+ 0.6	7	7,049	s.	54	s.	14	12	11	7	4.7	
Northern Slope.							57.1	— 1.0										65	1.74	+ 0.8										4.6	
Havre	2,505	46	47	27.34	29.97	+ .01	53.4	— 1.5	82	6	64	19	26	43	39	47	42	71	2.21	+ 1.0	14	6,844	sw.	35	w.	24	13	7	10	5.1	0.3
Miles City	2,371	42	50	27.44	29.90	— .08	57.8	— 2.2	92	6	69	28	26	47	38	52	49	83	2.00	+ 1.3	7	5,145	n.	36	nw.	24	17	7	6	3.9	T.
Helena	4,110	88	93	25.82	29.99	.00	53.0	— 2.8	80	3	63	20	26	43	34	44	36	61	1.39	+ 0.2	12	5,794	sw.	38	n.	1	12	7	11	5.2	T.
Kalispell	2,965	45	51	26.92	29.99	....	51.9	....	80	7	62	24	26	42	35	46	40	69	3.02	....	10	4,344	nw.	25	n.	8	9	5	16	6.0	
Rapid City	3,234	46	50	26.59	29.88	— .08	60.0	— 1.4	92	4	71	29	26	49	40	51	45	65	2.09	+ 1.5	9	6,825	nw.	45	w.	4	14	11	5	4.1	T.
Cheyenne	6,088	56	64	24.04	29.95	.00	56.2	0.0	85	8	69	29	26	44	39	45	34	53	2.19	+ 1.3	7	7,201	s.	39	nw.	18	13	12	5	4.2	T.
Lander	5,372	28	36	24.64	29.97	.00	54.4	— 1.3	86	3	70	27	18	39	46	44	35	58	2.05	+ 1.3	4	3,102	sw.	30	nw.	30	15	11	4	4.1	12.0
North Platte	2,821	43	52	27.09	29.97	— .01	64.9	+ 2.5	98	8	78	35	27	52	46	55	48	63	0.25	— 1.0	8	7,214	se.	34	se.	23	12	14	4	4.6	
Middle Slope.							68.6	+ 1.3										66	3.68	+ 2.0										4.7	
Denver	5,291	79	151	24.74	29.95	+ .01	61.7	— 0.2	90	8	76	34	26	48	42	48	35	48	0.87	+ 0.1	5	5,617	s.	36	sw.	4	14	11	5	4.1	T.
Pueblo	4,685	80	86	25.30	29.93	.00	63.8	— 1.4	91	8	78	33	29	49	49	49	36	47	0.10	— 0.3	2	4,769	se.	36	n.	18	18	9	3	3.7	
Concordia	1,398	42	47	28.52	29.98	.00	69.8	+ 2.0	99	5	80	43	29	60	35	61	58	73	3.59	+ 1.2	7	6,024	se.	31	s.	24	10	14	6	5.0	
Dodge	2,509	44	52	27.39	29.94	— .01	70.0	+ 2.4	95	6	81	38	29	59	38	60	56	73	4.63	+ 3.3	8	8,149	se.	43	s.	24	14	10	6	4.6	
Wichita	1,358	78	85	28.58	29.98	+ .01	72.2	+ 2.2	100	6	82	46	29	63	32	63	60	75	5.64	+ 3.0	11	6,108	s.	38	nw.	14	13	9	8	4.9	
Oklahoma	1,214	54	62	28.70	29.96	— .01	74.4	+ 2.8	97	15	84	51	17	65	30	68	65	80	7.26	+ 4.4	14	6,976	s.	37	se.	10	9	7	14	6.0	
Southern Slope.							72.9	+ 1.9										72	7.45	+ 5.2										4.5	
Abilene	1,738	45	54	28.16	29.93	— .05	77.2	+ 2.6	96	15	86	57	27	68	25	68	64	73	9.65	+ 7.2	8	6,438	se.	34	nw.	9	14	10	6	4.8	
Amarillo	3,676	54	61	26.27	29.94	— .03	68.6	+ 1.2	91	14	80	41	27	58	36	60	55	70	5.25	+ 3.1	15	10,223	s.	50	s.	24	14	8	8	4.2	
Southern Plateau.							69.9	— 1.1										39	1.76	+ 1.0										3.0	
El Paso	3,762	10	110	26.15	29.86	— .03	76.7	+ 3.6	98	15	88	54	24	65	35	60	50	49	2.18	+ 1.1	8	6,356	e.	51	nw.	23	14	14	2	3.6	
Santa Fe	7,013	47	50	23.33	29.96	.00	60.4	+ 0.5	78	16	70	40	29	51	30	49	37	52	3.00	+ 1.5	13	4,794	se.	40	s.	2	14	11	5	4.1	
Flagstaff	6,907	12	25	23.36	30.03	....	52.8	....	78	1	69	21	28	37	48	44	....	....	2.77	+ 2.1	6	....	sw.	....	....	....	15	7	8	....	
Phenix	1,108	47	57	28.68	29.82	.00	78.9	— 1.9	102	6	94	50	26	64	41	58	40	30	0.12	— 0.4	1	3,150	e.	29	se.	21	17	9	4	2.8	
Yuma	141	16	50	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Independence	3,910	51	58	25.92	29.82	— .03	63.5	— 6.5	83	22	76	38	24	51	32	47	23	26	0.75	+ 0.7	4	6,160	nw.	48	w.	24	22	7	1	1.6	
Middle Plateau.							59.0	— 3.6										40	0.72	+ 0.1										3.4	
Carson City	4,720	82	92	25.23	29.94	+ .03	55.4	— 3.9	85	2	70	25	27	40	48	44	31	44	0.03	— 0.2	3	4,738	w.	34	w.	5	18	9	3	2.8	
Winnemucca	4,344	59	70	25.63	29.96	+ .03	54.6	— 5.5	86	2	70	19	27	39	48	43	25	39	0.22	— 0.1	5	5,913	ne.	35	w.	13	15	7	8	4.1	
Cedar City	5,850	36	47	24.25	29.95	....	59.0	....	79	12	70	29	28	48	36	44	23	35	1.18	....	4	4,703	se.	24	sw.	13	20	6	4	2.7	2.4
Salt Lake City	4,366	105	110	25.58	29.92	— .02	62.7	— 1.6	88	6	74	32	24	51	33	47	30	36	1.44	+ 0.5	4	4,701	se.	34	sw.	16	18	11	1	2.8	
Grand Junction	4,608	43	50	25.37	29.94	....	63.3	— 3.4	91	2	76	39	26	51	38	49	34	45	1.18	+ 0.2	10	3,936	nw.	27	sw.	17	12	9	9	4.5	
Northern Plateau.							58.6	— 1.2										56	0.97	+ 0.2										4.6	
Baker City	3,471	53	58	26.42	29.97	— .01	55.1	— 0.7	83	12	67	29	26	43	36	45	36	56	1.06	+ 0.3	10	3,680	s.	25	nw.	24	9	6	15	5.8	
Boise	2,739	61	68	27.12	29.93	— .05	59.5	— 1.3	86	11	73	30	27	46	36	48	37	50	1.06	+ 0.6	3	2,837	nw.	23	se.	4	16	9	5	3.5	
Pocatello	4,482	48	56	25.44	29.90	— .08	58.8	— 1.7	85	6	72	21	27	45	41	45	28	38	0.08	— 0.6	3	7,672	s.	40	sw.	4	17	7	6	3.8	
Spokane	1,943	99	107	27.94	29.97	— .01	58.2	+ 0.1	86	7	69	31	26	47	37	49	40	58	1.65	+ 0.6	9	3,902	s.	48	w.	22	9	10	11	5.7	
Walla Walla	1,000	65	73	28.91	29.96	— .04	61.5	— 2.4	90	3	72	36	26	51	35	56	53	77	0.98	+ 0.1	10	3,638	s.	35	w.	22	13	12	5	4.1	
N. Pac. Coast Reg.							57.2	— 0.3										78	1.81	— 1.4										5.2	
Neah Bay	50	7	24	29.98	30.03	+ .02	53.0	— 2.2	72	11	59	41	27	48	23	51	50	89	2.44	— 4.9	6	3,678	w.	38	w.	22	14	9	7	4.3	
Port Crescent	259	15	20	....	....	....	53.2	+ 0.4	81	11	63	33	26	44	36	....	....	....	1.58	— 1.9	8	2,579	w.	22	w.	23	8	14	8	5.1	
Seattle	123	114	121	29.90	30.03	— .01	58.6	+ 1.4	79	12	66	42	26	51	25	53	49	75	0.72	— 1.6	6	2,945	se.	24	s.	22	6	14	10	5.8	
Tacoma	213	113	120	....	....	....	57.2	+ 1.0	77	12	65	39	26	49	27	....	....	....	1.57	— 0.6	6	3,282	n.	30	sw.	22	8	10	12	6.0	
Astoria	20	57	64	....	....	....	58.4	— 0.8	82	11	65	43	30	52	26	....	....	....	2.78	— 1.5	10	....	nw.	....	....	....	11	10	9	5.0	
Portland, Oreg	154	208	213	29.87	30.03	.00	60.0	— 0.7	87	12	69	41	29	51	28	54	51	76	1.93	+ 0.2	10	5,288	nw.	29	sw.	22	11	10	9	5.1	
Roseburg	518	56	67	29.44	30.00	— .03	59.8	— 1.1	87	2	71	38	27	49	37	53	48	71	1.67	+ 0.6	9	2,597	n.	20	nw.	1	11	11	8	4.9	
Mid. Pac. C'st Reg.							63.1	0.0										64	0.36	— 0.3										3.4	
Eureka	62	60	69	29.94	30.00	+ .01	56.6	+ 1.2	69	27	62	45	25	52	21	54	51	85	0.21	— 1.0	4	4,556	nw.	44	nw.	21	13	12	5	4.3	
Mount Tamalpais	2,375	11	18	27.50	29.96	....	60.4	....	87	22	67	43	24	54	25	50	41	61	1.10	....	4	12,987	w.	67	nw.	15	17	6	7	3.3	
Red Bluff	332	50	56	29.55	29.90	.00	69.9	— 3.9	100	1	81	52	17	59	36	55	43	45	0.21	— 0.5	2	5,262	n.	37	n.	23	21	7	2	2.3	
Sacramento	69	106	117	29.82	29.89	— .01	67.0	— 2.5	95	22	80	47	25	54	35	55	45	52	0.06	— 0.3	1	6,622	sw.	36	nw.	20	21	4	5	3.1	
San Francisco	155	161	167	29.79	29.95	+ .02	63.3	+ 2.9	92	21	70	47	30	56	33	56	52	75	0.46	+ 0.2	2	7,862	w.	32	sw.	1	22	5	3	2.6	
Point Reyes Light	....	12	16	....	....	....	58.8	+ 2.2	84	22	65	45	30	52	28	....	....	....	0.87	— 0.1	4	8,537ᵃ	nw.	72	nw.	23	15	4	11	4.5	
S. Pac. Coast Reg.							66.6	— 1.7										60	0.04	— 0.1										2.2	
Fresno	330	67	70	29.52	29.87	+ .01	69.5	— 5.0	96	22	84	48	26	55	37	55	41	44	0.16	0.0	1	2,636	nw.	15	ne.	3	25	4	1	1.6	
Los Angeles	338	74	82	29.55	29.90	+ .02	67.0	— 1.5	94	28	79	49	20	55	38	57	52	68	T.	— 0.1	0	3,323	w.	18	s	23	18	9	3	2.4	
San Diego	87	94	102	29.80	29.90	+ .01	65.6	— 1.4	87	29	71	53	26	60	24	58	53	68	T.	— 0.1	0	4,350	nw.	23	s.	23	27	1	2	1.8	
San Luis Obispo	201	10	46	29.73	29.95	+ .04	64.4	+ 1.0	94	21	78	41	30	51	43	54	47	61	T.	— 0.1	0	3,677	w.	22	w.	16	18	8	4	3.0	
West Indies.																															
Basseterre	29	41	54	29.94	29.97	....	81.8	....	88	16	86	72	27	77	14	76	74	77	4.29	....	17	7,218	e.	30	e.	1	11	11	8	5.1	
Bridgetown	30	57	65	29.92	29.95	....	81.4	....	90	16	87	71	1	76	15	76	74	78	4.94	— 2.0	19	5,700	e.	29	ne.	18	2	22	6	6.2	
Cienfuegos	52	62	67	29.87	29.92	....	80.4	....	93	1	88	69	16	72	21	75	74	86	7.58	....	15	5,173	ne.	38	s.	5	16	7	7	4.2	
Havana	57	87	105	29.88	29.94	....	80.4	....	90	14	87	71	11	74	16	75	73	83	4.25	— 2.5	12	6,795	e.	30	se.	10	9	13	8	5.3	
Kingston	286	38	52	29.61	29.91	....	79.4	....	91	21	87	69	22	72	20	73	71	82	8.28	....	16	3,861	ne.	22	se.	5	3	19	8	6.4	
Port of Spain	40	65	66	29.80	29.93	....	80.8	....	92	14	88	70	11	73	20	75	73	79	5.54	....	12	3,044	e.	17	ne.	2	1	16	13	7.0	
Puerto Principe	352	55	62	29.59	29.94	....	79.6	....	96	1	89	66	30	70	26	74	73	88	11.06	....	15	4,674	ne.	25	s.	4	11	10	9	5.2	
Roseau	25	37	47	29.92	29.94	....	81.6	....	91	17	88	72	1	75	17	74	72	74	4.26	....	19	3,708	e.	20	se.	1	2	23	5	5.9	
San Juan	82	48	73	29.89	29.97	....	81.2	....	93	16	87	72	2	75	17	75	73	79	3.05	— 2.1	13	6,948	e.	35	s.	2	10	13	7	5.0	
Santiago de Cuba	82	26	33	29.83	29.91	....	80.7	....	94	25	89	69	4	73	22	75	73	85	29.49	....	14	2,376	ne.	13	sw.	3	7	15	8	5.7	
Santo Domingo	57	37	44	29.91	29.97	....	80.0	....	92	20	87	71	23	73	18	75	74	85	6.81	....	18	3,789	n.	27	s.	3	15	9	6	4.6	
Turks Island	11	6	20	....	....	....	82.0	....	91	*	88	70	9	76	19	....	....	....	4.50	....	8	....	se.	....	....	....	4	18	8	6.1	
Willemstad	75	39	46	29.80	29.87	....	83.3	....	90	6	88	71	23	78	13	76	74	77	2.52	....	5	8,664	e.	27	se.	4	11	16	3	4.5	

NOTE.—The data at stations having no departures are not used in computing the district averages. Letters of the alphabet denote number of days missing from the record. *Two or more dates. †The anemometer cups were blown away at 5:30 p. m. of 8th, at which time the wind was blowing at the rate of 84 miles per hour from the northeast; it is estimated that later the wind attained a velocity of 120 miles per hour from the southeast.

TABLE II.—*Climatological record of voluntary and other cooperating observers, September, 1900.*

Stations.	Temperature. (Fahrenheit.) Maximum.	Minimum.	Mean.	Precipitation. Rain and melted snow.	Total depth of snow.
Alabama.	°	°	°	*Ins.*	*Ins.*
Ashville	94	50	75.8	5.35	
Bermuda	97	60	79.6	6.89	
Birmingham	94	53	79.3	3.75	
Brewton	100	55	80.6	6.11	
Bridgeport				2.20	
Citronelle	98	63	80.5	4.39	
Clanton	89	55	75.0	4.88	
Daphne [e]	97	68	78.9	3.06	
Decatur	94	48	76.7	1.96	
Demopolis				4.28	
Enfaula [a]	98	52	79.0	2.42	
Eutaw	98	58	80.3	3.52	
Florence [a]				1.55	
Florence [b]	95	48	77.5	2.08	
Fort Deposit	97	58	78.1	2.21	
Gadsden	98	50	78.4	5.59	
Goodwater	96	54	78.0	3.44	
Greensboro	92	58	78.4	4.66	
Hamilton	94	52	78.1	5.00	
Healing Springs	94	56	77.9	8.23	
Highland Home	94	59	78.0	2.73	
Livingston [a]	93	58	78.5	2.46	
Lock No. 4	94	52	76.1	4.43	
Madison Station	96	48	77.6	2.85	
Maplegrove	97	55	76.6	6.58	
Marion	98	58	80.2	8.55	
Newbern	92	58	78.7	4.73	
Newton	93	62	76.6	2.16	
Oneonto	89	48	74.3	5.72	
Opelika	94	57	78.0	6.16	
Oxanna	93	51	77.0	4.69	
Pineapple	96	57	79.5	4.03	
Prattville [e]	95	55	78.3		
Pushmataha	95	58	79.2	4.71	
Riverton	94	50	76.6	1.86	
Scottsboro	92	46	75.1	6.21	
Selma	96	56	78.8	4.00	
Talladega	95[e]	52	75.9[e]	5.68	
Tallassee				3.20	
Thomasville	97	58	77.7	5.35	
Tuscaloosa	98	55	78.5	3.31	
Tuscumbia	94	51	77.8	1.91	
Tuskegee	97	52	78.7	0.46	
Union Springs	96	57	79.5	1.15	
Uniontown	97	56	78.4	2.75	
Valleyhead	95	55	75.6	4.70	
Warrior				5.67	
Wetumpka	94[f]	54	78.5[e]	5.26	
Alaska.					
Sitka	65	32	51.0	7.82	
Arizona.					
Allaire Ranch				3.44	
Arizona Canal Co. Dam	101	48	77.7	0.21	
Aztec *[5]	105	60	87.2	0.27	
Benson *[1]	92	60	77.0	2.11	
Bisbee	91	49	69.4	6.54	
Blaisdell *[1]	113	60	78.9		
Bowie *[5]	90	58	77.1	3.08	
Buckeye	101	43	76.4	0.00	
Camp Creek	93	50	78.6	1.66	
Casagrande *[1]	98	60	81.2	0.30	
Champie Camp	106	49	78.4	T.	
Cochise *[1]	100	56	75.2	T.	
Congress	94	50	75.4	0.17	
Dragoon Summit *[1]	88	53	68.6	2.41	
Dudleyville	101	46	74.4	2.20	
Fort Apache	87	41	63.8	2.79	
Fort Defiance	84	30	57.8	1.82	
Fort Grant	92	52	70.5	4.30	
Fort Huachuca	91	50	69.6	5.34	
Fort Mohave [e]	105	51	78.0	0.00	
Gilabend *[1]	105	58	82.0	0.00	
Maricopa *[1]	101	59	82.4	T.	
Mesa	102	45	77.6	0.10	
Mohawk Summit *[1]	103	64	85.1	0.00	
Mount Huachuca	91	50	69.6	5.84	
Natural Bridge				0.75	
Nogales	97	48	73.1	2.70	
Oracle	89	50	70.8	2.38	
Oro				5.36	
Pantano *[1]	95	60	73.8	1.37	
Parker	109	44	77.8	T.	
Peoria	106	45	80.1	T.	
Phenix	104	46	77.2	0.09	
Pima	100	45	73.2	2.79	
Pinal Ranch				1.24	
Prescott	88	28	59.5	0.14	
San Simon *[1]	99	60	72.5	3.18	
Sentinel *[1]	103	61	83.5	0.00	
Signal	105	40	73.1	T.	
Silverking				1.01	
Snowflake	86	30	61.0	3.38	
Strawberry	88	19	55.8	0.90	
Supai	105	44	75.0	0.66	
Tombstone	94	52	71.9	3.21	
Tuba	92	40	67.0	0.60	
Arizona—Cont'd.					
Tucson	100	50	76.6	0.85	
Vail *[5]	99	60	77.0	2.14	
Willcox *[1]	95	58	76.4	1.97	
Winslow	88	32	64.8	0.46	
Yarnell				0.13	
Arkansas.					
Amity	98	55	79.6	3.50	
Arkadelphia	100	55	80.4	3.58	
Arkansas City				2.12	
Batesville	100	52	78.8	4.27	
Beebranch [d]	99	50	78.6	3.60	
Blanchard Springs	98	57	79.5	1.24	
Brinkley	96	52	78.0	3.60	
Camden [a]				4.91	
Camden [b]	100	55	79.2	3.87	
Conway	97	53	79.4	5.69	
Corning	94	49	75.4	5.45	
Dallas	96	55	78.6	5.90	
Dardanelle				2.52	
Elon [f]	95	53	79.7	2.52	
Fayetteville	93	53	74.0	4.98	
Forrest City	95	53	78.8	2.80	
Fulton				3.20	
Hardy	92	53	75.4	4.22	
Helena [a]				3.90	
Helena [b]	96	56	79.3	3.79	
Hot Springs [b]				5.74	
Ione	95	50	76.8	4.42	
Jonesboro	99	54	78.6	7.33	
Keesees Ferry	96	53	75.6	5.48	
Lacrosse	93	52	75.8	4.80	
Lonoke	96	52	79.3	2.67	
Lutherville	92	54	75.8	3.49	
Malvern	102	54	77.4	2.23	
Marianna	94	51	77.7	6.80	
Marvell	96	54	79.7	4.54	
Mossville	88	48	71.0	11.01	
Mount Nebo	88	55	74.5	2.60	
New Gascony	96	52	78.9	4.32	
Newport [a]				4.97	
Newport [b]	97	51	77.9	5.10	
Newport [c]	96	50	77.8	4.79	
Oregon	92	51	74.2	5.03	
Osceola	100	54	79.5	5.98	
Ozark	97	63	79.4	4.00	
Pinebluff	99	53	80.3	4.08	
Pocahontas	92	58	75.0	2.75	
Pond	91	49	73.6	4.99	
Prescott	102	68	82.0	3.74	
Rison	101	55	80.8	4.16	
Rosadale	102	59	80.9	3.60	
Russellville	94	55	78.0	2.61	
Silversprings	93	51	74.6	9.17	
Spielerville	97	55	78.4	3.23	
Stuttgart	90	50	79.4	3.87	
Texarkana	104	61	80.5	5.95	
Warren	103	52	79.4	3.74	
Washington	98	61	80.0	3.21	
Wiggs	99	54	77.0	6.75	
Witts Springs	97	50	74.5	5.08	
California.					
Agnew	101	44	67.0	0.05	
Angiola	100	37	66.6	T.	
Bakersfield	101	41	68.7	0.00	
Ballast Point L. H				0.00	
Bear Valley				0.92	
Bellevue				0.62	
Berkeley	92	51	63.8	0.05	
Beverly				T.	
Bishop	90	39	65.0	0.39	
Blue Lake				0.27	
Boca *[1]	82	18	44.5	0.66	
Bodie	72	10	41.8	0.8	10.0
Bowman				1.38	
Branscomb				0.33	
Caliente *[1]	91	52	68.7	0.00	
Campbell	97	39	63.6	0.30	
Cape Mendocino L. H				0.00	
Cedarville	88	25	54.4	0.67	
Chico *[1]	104	53	72.6	T.	
Cisco *[1]	75	33	46.7	0.33	
Claremont	92	41	64.1	0.05	
Corning *[1]	100	58	69.4	0.00	
Coronado	87	50	65.6		
Cottonwood				1.25	
Crescent City	76	38	56.8	0.58	
Crescent City L. H				0.68	
Cuyamaca *[6]	74	32	57.2	0.92	
Delano *[1]	93	57	71.8	T.	
Delta *[1]	98	46	63.7	0.97	
Deweyville	98	42	68.6	T.	
Drytown	96	42	66.0	0.23	
Dunnigan *[1]	95	53	69.0	T.	
Durham *[1]	97	49	68.4	T.	
East Brother L. H				0.15	
Edmanton *[1]	89	35	54.2	0.20	
California—Cont'd.					
Elcajon	98	37	65.3	T.	
Elsinore	102	44	68.6	T.	
Escondido	98	32	62.2	0.03	
Fallbrook	94	42	65.6	0.06	
Fordyce Dam				1.32	
Fort Ross	88	40	61.2	0.11	
Fort Tejon				0.17	
Georgetown	91	42	62.6	1.00	
Gilroy (near)	104	36	65.4	0.00	
Goshen *[5]	95	48	70.1	0.25	
Grand Island *[5]	99	49	70.3	0.05	
Grass Valley				0.72	
Greenville	95	20	55.6	T.	
Hanford	95	40	66.9	0.00	
Healdsburg	106	33	64.2	0.07	
Hollister	100	38	64.2	0.00	
Humboldt L. H				0.19	
Indio *[1]	101	63	77.5	0.08	
Iowa Hill *[1]	86	50	61.3	0.99	
Irvine	104	58	74.0	0.00	
Jackson (near)	88	42	62.6	0.41	
Jolon				0.00	
Kennedy Gold Mine	89	41	62.0	0.35	
Kent				0.60	
King City *[1]	96	43	60.5	0.00	
Kingsburg *[1]	91	62	69.2	0.00	
Kono Tayee	88[c]	50[c]	65.6[c]	T.	
Lamesa				0.01	
Lankershim	99	43	68.2	T.	
Laporte [e]	79	34	50.4	0.61	
Las Fuentes Ranch				T.	
Legrand	99	40	68.0	0.00	
Lemoncove	101	46	70.6	0.00	
Lemoore [a] *[1]	94	47	69.5	0.00	
Lick Observatory	78	38	56.3	0.08	
Lime Point L. H				0.67	
Lodi	97	42	67.0	0.12	
Los Gatos [b]	99	44	65.6	0.05	
Mammoth *[1]	101	62	80.0	0.20	
Manzana	90	46	67.6	0.10	
Mare Island L. H				0.14	
Merced [b]	100	41	68.0	T.	
Mills College				T.	
Milo				0.10	
Milton (near)	95	50	69.7	0.17	
Modesto *[1]	102	50	71.5	0.13	
Mohave *[1]	90	45	64.2	0.01	
Mokelumne Hill *[5]		46	61.2	0.19	
Monterio	88	48	63.6	0.00	
Monterey *[5]	84	46	66.4	0.00	
Morena	90	38	64.8	0.11	
Mountainview				0.45	
Napa [b]	102	40	64.5	0.10	
Nevada City	83	35	57.3	0.55	
Niles *[1]	104	48	68.8	0.02	
North Bloomfield	84	41	59.8	0.95	
North Ontario	89	46	64.2	0.64	
Oakland [a]	93	49	64.7	0.06	
Ogilby *[5]	107	65	87.6	T.	
Oleta *[1]	90	43	60.0	0.30	
Orland *[1]	110	55	71.0	0.07	
Palermo	102	44	67.8	0.27	
Paso Robles [b]	100	36	63.1	T.	
Peachland *[5]	96	42	63.9	0.19	
Piedras Blancas L. H				0.00	
Pigeon Point L. H				0.07	
Pilot Creek				0.47	
Pine Crest	89	49	67.0	0.06	
Placerville	92	32	60.4	0.55	
Point Ano Nuevo L. H				0.18	
Point Arena L. H				0.00	
Point Bonita L. H				1.00	
Point Conception L. H				0.00	
Point Firmin L. H				0.00	
Point George L. H				0.18	
Point Hueneme L. H				0.00	
Point Lobos	82	49	60.5	0.59	
Point Loma L. H				0.00	
Point Montara L. H				0.56	
Point Pinos L. H				0.00	
Point Sur L. H				0.07	
Pomona (near)	97	44	66.4	0.00	
Poway *[5]	94	50	62.8	T.	
Quincy	87	24	54.0	0.04	
Ranch House				T.	
Raymond	104	43	72.0	T.	
Redding	98	48	69.2	2.48	
Redlands	96	45	67.6	0.50	
Reedly	99	42	68.4	0.00	
Represa	90	50	66.6	0.25	
Riovista	95	49	68.0	0.01	
Riverside	99	45	68.2	0.00	
Roe Island L. H				0.00	
Rosewood	103	36	66.2	0.59	
Sacramento [a]	92	42	65.2	0.07	
Salinas *[1]	88	52	61.1	0.00	

TABLE II.—*Climatological record of voluntary and other cooperating observers*—Continued.

Stations.	Temperature. (Fahrenheit.) Maximum.	Minimum.	Mean.	Precipitation. Rain and melted snow.	Total depth of snow.
California—Cont'd.	°	°	°	*Ins.*	*Ins.*
Salton *5	113	63	85.8	0.00	
San Bernardino	100	40	66.2	0.23	
San Jacinto	98	41	66.0	0.01	
San Jose	94	52	68.4	0.17	
San Leandro *5	94	46	64.4	0.04	
San Luis L. H.				0.08	
San Mateo *1	93	53	66.1	0.50	
San Miguel *1	90	45	65.5	0.00	
San Miguel Island	88	51	63.6	0.00	
Santa Barbara *a*	88	50	65.2	0.04	
Santa Barbara L. H				0.00	
Santa Clara *a*				0.21	
Santa Cruz *b*	96	37	62.4	0.13	
Santa Cruz L. H				0.10	
Santa Maria	94	44	65.2	T.	
Santa Paula	88	50	67.1	0.00	
Santa Rosa *5	99	43	64.8	0.00	
Shasta	104	47	69.8	3.43	
Sierra Madre	90	50	67.0	0.06	
Sonoma				0.12	
S. E. Farallone L. H				0.25	
Stanford University	94	44	63.8	0.32	
Stockton	94	51	69.2	0.04	
Summerdale	82	34	54.6	0.75	
Susanville	84	30	53.4	0.25	
Tehama *1	100	60	70.0	0.00	
Tejon Ranch	94	52	69.6	0.06	
Templeton *1	95	52	72.5	0.00	
Thermalito	101	49	69.3	0.33	
Trinidad L. H				0.64	
Truckee *1	78	38	53.3	0.00	
Tulare *b*				0.44	
Tulare *c*	100	42	68.6	0.18	
Ukiah	101	32	63.6	0.35	
Upperlake	99	36	64.0	0.03	
Upper Mattole *1	90	36	57.8	0.32	
Vacaville *1	102	50	69.4	0.07	
Ventura	93	51	64.4	T.	
Visalia *b*	98	40	68.2	0.09	
Volcano Springs *1	108	65	82.8	0.03	
Walnutcreek	98	44	67.6	0.00	
Westpoint				0.15	
West Saticoy				T.	
Wheatland	94	43	66.4	0.11	
Williams *1	97	53	71.7	T.	
Wilmington *1	80	50	65.4	0.00	
Wire Bridge *5	94	47	66.8	0.43	
Yerba Buena L. H				0.52	
Yreka	89	32	58.8	0.43	
Colorado.					
Alford	88	27	55.1	2.01	T.
Arkins				1.72	
Blaine	98	35	67.2	2.09	
Boulder	88	33	61.6	1.54	
Boxelder				1.55	T.
Breckenridge	74	12	44.8	0.30	3.0
Buenavista					T.
Canyon	89	30	62.8	0.79	
Castlerock	88	26	58.7	0.06	
Cedaredge	89	29	58.8	2.72	
Cheyenne Wells	93	34	64.2	1.31	
Clearview	72	25	49.8	1.38	T.
Collbran				0.62	
Colorado Springs	89	32	59.4	0.61	
Cope	94	34	63.7	0.44	0.3
Cripplecreek	84	30	56.5	0.04	T.
Crook	104	30	65.0	0.61	
Delta	99	26	61.2	1.27	
Dumont				1.25	T.
Durango	86	20	54.5	2.60	
Fort Collins	88	30	58.6	1.92	
Fort Morgan	92	30	62.0	0.55	
Fox				0.60	
Gilman				1.38	
Gleneyrie	86	32	58.2	0.97	
Greeley	91	31	60.8	1.07	T.
Grover				1.25	
Hamps	88	27	58.0	0.65	
Hoehne	90	30	62.3	0.59	
Holly	96	31	67.8	3.32	
Hugo				0.25	
Lake Moraine	70	24	48.3	1.03	T.
Lamar	99	30	67.8	2.42	
Laporte				1.53	
Las Animas	94	31	66.4	1.65	
Lay				0.59	
Leadville *1	72	18	45.3	1.00	7.0
Leroy	95	31	61.8	0.35	T.
Longs Peak	72	23	47.0	1.93	3.0
Mancos	85	21	56.2	1.72	
Marshall Pass				T	
Meeker	84	19	52.2	1.50	
Mitchell				1.06	5.0
Montrose				1.28	
Moraine	79	26	51.8	2.19	
Pagoda	87	20	54.4	1.04	
Colorado—Cont'd.	°	°	°	*Ins.*	*Ins.*
Parachute	92			1.30	
Perrypark				T.	T.
Rangely	89	25	55.6	1.35	
Rockyford	95	30	65.2	0.08	
Rogers Mesa	90	32	61.2	2.00	
Ruby				2.00	10.0
Saguache	82	23	54.4	0.31	
Salida	88	23	58.2	T.	T.
San Luis	81	24	54.9	1.83	
Santa Clara	81	28	55.9	0.94	
Sapinero				0.85	
Sargents				0.10	
Seibert				0.91	
Silt	89	30	59.2	1.07	
Springfield				1.53	
Strickler Tunnel				0.90	2.8
Sugarloaf	80			2.97	
Trinidad	92	31	64.2	0.72	
Troutvale	76	10	44.4	2.75	14.0
T S. Ranch	85	34	60.4	1.04	
Twinlakes				2.32	T.
Vilas				5.15	
Wagon Wheel	76	9	47.0	1.42	2.0
Walden	82	21	51.1	0.90	T.
Wallet					T.
Westcliffe	82	24	53.1	1.10	
Wray	98	31	64.4	0.15	
Yuma				0.16	0.5
Connecticut.					
Bridgeport	92	41	68.2	1.99	
Canton	92	34	64.4	2.56	
Colchester	90[1]	45[1]	67.0[1]	2.48	
Falls Village				1.85	
Hartford *b*	91	42	66.2	1.97	
Hawleyville	86	37	65.4	3.00	
Lake Konomoc				2.87	
Middletown	97	37	67.4	2.75	
New London	90	44	67.6	4.03	
North Grosvenor Dale	92	34	64.4	2.09	
Norwalk	93	38	66.6	3.44	
Southington	90	38	65.4	2.20	
Storrs	92	37	63.2	2.27	
Voluntown	90	35	65.2	3.10	
Wallingford				3.54	
Waterbury	96	37	68.6	2.15	
West Cornwall	90	39	64.6	1.75	
West Simsbury				2.32	
Winsted *1	90	38	63.6		
Delaware.					
Milford	93			1.93	
Millsboro	95	43	72.0	1.75	
Newark	89	43	69.9	3.77	
Seaford	95	46	73.0	2.89	
Wyoming				3.40	
District of Columbia.					
Distributing Reservoir *5	93	48	74.0	4.07	
Receiving Reservoir *5	90	50	73.6	4.41	
West Washington	96	42	73.6	4.51	
Florida.					
Archer	98	60	80.2	4.28	
Bartow	93	63	80.8	4.36	
Brooksville	91	67	79.7	2.70	
Carrabelle	94	64	79.8	0.80	
Clermont	98	65	81.0	3.13	
Dalkeith	97	61	80.4	2.65	
De Funiak Springs	97	58	80.5	5.24	
Deland	95	66	80.5		
Earnestville	95	68	82.3	7.15	
Eustis	98	65	82.8	3.74	
Federal Point	92	62	79.4	8.17	
Fort George *1	92	75	81.7		
Fort Meade	95	64	80.7	10.50	
Gainesville	98	65	81.0	2.66	
Huntington	92	61	78.4	5.73	
Hypoluxo	95	71	81.7	9.67	
Inverness	95	62	80.6	3.68	
Jasper	95	60	79.6	1.50	
Kissimmee	96	64	81.4	4.50	
Lake Butler	97	60	80.0	2.92	
Lake City	98	60	80.9	2.21	
McAlpin	98	60	81.0	3.13	
Macclenny	99	56	80.4	2.22	
Manatee	91	65	79.4	6.64	
Marianna	95	58	79.0	2.79	
Merritt Island	92	74	82.8	3.29	
Micanopy	98	61	80.6	4.55	
Middleburg	96			5.29	
Myers	89	68	79.6	8.29	
New Smyrna	94	65	79.7	5.09	
Nocatee	96	62	81.5	4.80	
Ocala	97	62	80.8	4.46	
Orange City	94	64	81.8	5.62	
Orlando	92	68	80.8	5.53	
Plant City	98	63	79.8	6.45	
Rockwell				4.73	
St. Andrews	94	62	80.0	6.15	
Florida—Cont'd.	°	°	°	*Ins.*	*Ins.*
St. Augustine	89	70	80.2	4.10	
St. Francis	96	60	79.0	5.28	
Sebastian	91	69	80.6	4.13	
Stephensville *1	96	68	79.0	2.82	
Sumner	97	60	80.4	1.73	
Switzerland *1	90	69	77.8	6.12	
Tallahassee	91	66	78.9	4.84	
Tarpon Springs	89	63	78.6	3.76	
Wausau	94	56	79.2	5.30	
Georgia.					
Adairsville	92	52	75.2	4.71	
Albany	98	58	80.7	1.06	
Allapaha	97	59	79.0	2.99	
Allentown	98	51	79.8	1.90	
Americus	94	57	78.2	1.58	
Athens *b*	91	51	74.2	3.80	
Bainbridge	95	58	78.8	2.19	
Bellville	103	58	80.2	2.14	
Blakely	89	58	74.6	2.46	
Brent	98	51	77.6	3.30	
Camak	95	54	77.9	2.07	
Canton				1.78	
Carlton				4.28	
Clayton	88	43	71.4	6.69	
Columbus	93[e]	60[e]	79.5[e]	2.13	
Covington	95	49	75.2	4.08	
Dahlonega	90	41	71.3	5.35	
Diamond	90	43	73.4	5.75	
Dublin				3.05	
Eastman	98	52	79.6	1.72	
Elberton	95	55	77.2	3.19	
Experiment	93	50	75.7	2.50	
Fitzgerald	97	52	77.2	1.69	
Fleming	98	47	77.6	6.12	
Fort Gaines	95	56	79.0	0.91	
Franklin	92	56	76.6	5.58	
Gainesville	89	50	73.0	1.49	
Gillsville	95	46	74.6	3.04	
Greenbush	94	44	74.2	5.27	
Griffin	92	55	77.8	2.92	
Harrison	96	52	77.8	1.82	
Hawkinsville	94	58	79.6	0.93	
Hephzibah				0.50	
Jesup	94	58	78.2	2.31	
Lost Mountain	94	49	76.7	4.98	
Lumpkin	98	58	80.4	1.30	
Mauzy	100	54	80.0	2.97	
Millen	99	52	78.9	1.87	
Morgan	97	54	76.6	1.95	
Naylor	100	56	80.1	2.39	
Newnan	93	51	75.6	3.06	
Oakdale				3.50	
Point Peter	100	49	77.3	4.74	
Poulan	101	52	78.7	1.38	
Putnam	95	55	77.3	2.24	
Quitman	94	55	78.2	4.71	
Ramsey	94	45	75.2	3.51	
Resaca				5.56	
Rome	92	49	75.2	4.72	
Statesboro	100	58	79.6	1.77	
Talbotton	100	51	77.0	3.00	
Tallapoosa	89	49	73.8	7.11	
Thomasville	99	61	81.2	2.10	
Toccoa	95	55	79.2	4.50	
Union Point	93	56	76.8	2.78	
Valona	95	60	79.4	4.55	
Washington	95	56	77.4	3.23	
Waycross	93	58	78.5	4.39	
Waynesboro	94	52	76.2	1.81	
Westpoint	91	54	77.3	6.93	
Idaho.					
Albion	90	18	56.6	0.44	T.
American Falls	87	15	56.4		
Atlanta	82	19	49.8	1.08	0.8
Blackfoot	89	20	56.6	T.	
Chesterfield	90	8	47.6	0.06	T.
Downey	84	20	54.2	0.02	T.
Forney	90	11	52.0	0.88	T.
Garnet	98	33	64.3	0.74	
Hagerman	101	25	62.8	0.10	
Hailey	94	24	56.8	0.96	
Kootenai	70	28	53.4	0.74	
Lake	70	10	40.0	0.40	T.
Lakeview	81	29	56.0	3.05	
Lost River	86	22	52.4	0.12	T.
Murray	81	24	52.8	2.93	
Oakley	90	23	56.0	0.45	
Ola	90	29	59.2	1.06	
Paris	86	20	53.4	0.20	
Payette	94	26	61.6	0.74	
Pollock	87	28	59.1	0.75	
Priest River	87	28	54.8	1.92	
St Maries	86	25	56.9	3.34	
Salubria	94	21	58.6	0.91	
Soldier	86	16	52.8	0.23	1.2
Swan Valley	88	9	52.8	0.11	

TABLE II.—*Climatological record of voluntary and other cooperating observers*—Continued.

Stations.	Temperature. (Fahrenheit.) Maximum.	Minimum.	Mean.	Precipitation. Rain and melted snow.	Total depth of snow.
	°	°	°	*Ins.*	*Ins.*
Idaho—Cont'd.					
Weston	88	28	56.6	0.66	
Illinois.					
Albion	96	43	71.5	4.91	
Alexander	93	36	70.4	5.29	
Ashton	89	36	64.7	3.51	
Astoria	90	37	67.1	3.53	
Aurora *a*	93	36	66.6	1.99	
Bloomington	95	36	69.5	1.55	
Bushnell	98	38	69.0	5.15	
Cambridge	89	39	66.4	3.24	
Carlinville	97	37	71.5	5.08	
Centralia	96	42	73.1	3.48	
Charleston	92	39	70.9	3.22	
Chemung	89	35	63.4	4.67	
Chester				3.17	
Cisne	95	40	72.6	3.94	
Coatsburg	95	37	69.4	4.04	
Cobden	102	43	75.4	2.55	
Danville	88	35	66.0	1.80	
Decatur	94	36	69.4	4.34	
Dixon	90	38	65.0	4.39	
Dwight	94	34	66.7	1.90	
Effingham	93	40	71.4	4.34	
Elgin	91	37	65.2	2.35	
Equality	101	41	75.5	2.81	
Flora	93	41	72.8	4.26	
Friendgrove *5	98	50	76.4	3.79	
Galva	91	37	66.0	4.65	
Glenwood *5	92g	44g	70.6g	1.54	
Grafton				4.64	
Grayville	94b	48c	75.4c	3.93	
Greenville	97	39	73.2	4.27	
Griggsville	95	39	71.2	5.50	
Halfway	99	44	75.6	2.71	
Halliday	99	39	75.6	4.73	
Havana		40		2.65	
Henry	93	35	67.2	3.64	
Hillsboro	97	42	72.0	3.27	
Joliet	91	38	66.6	2.05	
Kishwaukee	90	34	64.0	2.98	
Knoxville	96	34	66.2	3.86	
Lagrange	91	38	65.8	1.95	
Laharpe	95	38	68.4	2.90	
Lakevilla	93	34	66.0	1.86	
Lanark	92	31	63.0	2.87	
Loami				5.75	
McLeansboro	97	45	73.0	3.07	
Martinsville	92	38	71.0	4.23	
Martinton	94	30	67.4	2.09	
Mascoutah	94	42	72.4	3.32	
Mattoon	90	42	71.4	4.86	
Minonk	94	35	67.4	2.54	
Monmouth	94	36	66.8	5.31	
Monticello	95	34	70.2	2.84	
Morrisonville	94	39	70.8	4.22	
Mount Carmel				3.63	
Mount Pulaski	96	40	70.7	4.24	
Mount Vernon	98	40	72.5	4.07	
New Burnside	101	39	76.1	2.36	
Olney	95	43	73.6	3.67	
Ottawa	94	38	68.9	2.26	
Palestine	95	36	71.0	4.43	
Pana	94	37	69.6	3.36	
Paris	96	38	70.8	3.18	
Peoria *a*				3.13	
Peoria *b*	92	40	69.0	2.94	
Philo	94	32	68.2	1.64	
Plumhill	98	38	73.2	2.32	
Rantoul	93	38	68.8	5.53	
Raum	96	47	77.1	2.68	
Riley	88	39	64.9	2.58	
Robinson	96	38	72.6	5.01	
Rockford	90	36	66.3	3.70	
Roundgrove	87	36	65.0	4.07	
St. Charles *1	90	42	67.5	2.15	
St. John	100	42	75.4	3.20	
Shobonier *c*	96	34	71.2	4.33	
Strawn	93	35	68.0	1.50	
Streator	92	32	67.2	2.56	
Sullivan	95	37	70.0	2.75	
Sycamore	89	36	64.1	2.79	
Tilden	97	41	73.4	3.22	
Tiskilwa	92	39	65.7	4.67	
Tuscola	94	36	67.8	3.41	
Walnut	91	39	67.4	4.74	
Wheaton *3		45	63.6	2.39	
Winchester	93	38	69.8	5.56	
Winnebago	90	36	64.5	3.58	
Yorkville	94	32	66.0	2.53	
Zion	91	34	64.9	1.84	
Indiana.					
Anderson	94	40	69.8	2.02	
Angola	90	40	66.0	1.50	
Auburn	89c	35c	64.8c	1.39	
Bedford	96	40	72.6	0.64	
Bloomington	93	42	71.6	2.54	
Indiana—Cont'd.					
Bluffton	95	35	69.0	1.87	
Bright	92	43	72.7	T.	
Butlerville	96	42	72.7	0.83	
Cambridge City	95	41	68.8	2.59	
Columbus	96	40	72.0	0.54	
Connersville	95	40	70.6	3.27	
Crawfordsville	98	32	68.2	1.35	
Delphi	95	35	68.1	2.13	
Edwardsville *1	93	48	75.2	1.47	
Fairmount	99	32	69.6	2.12	
Farmland	92	39	66.7	2.43	
Fort Wayne	94	33	67.6	1.84	
Greencastle	91	40	70.2	2.65	
Greensburg	94	39	70.2	0.61	
Hammond	90	40	67.6	1.43	
Hector	96	38	68.6	1.76	
Huntington	94	38	67.7	1.98	
Jeffersonville	95	45	74.6	1.26	
Knightstown	96	41	71.3	2.54	
Kokomo	93	40	68.1	1.90	
Lafayette	93	35	69.3	2.75	
Laporte		32		1.63	
Logansport	91	38	67.2	1.92	
Madison *a*	96	43	74.0	1.32	
Madison *b*				0.87	
Marengo	95	37	71.8	1.02	
Marion	98	35	70.0	3.45	
Markle	94	34	67.8	2.10	
Mauzy	97	39	70.6	2.82	
Northfield	93	37	68.4	1.70	
Paoli	96	36	72.8	1.65	
Peru	93	39	69.2	1.71	
Prairie Creek *f*	102	36	74.3	4.83	
Princeton	96	38	72.0	5.20	
Rensselaer	96	31	67.0	1.30	
Richmond	96	41	70.2	1.63	
Rockport				0.50	
Rockville	94	37	69.8	2.38	
Salem	102	34	72.6	0.85	
Scottsburg	95	42	73.6	0.59	
Seymour	96	44	72.6	2.35	
Shelbyville	94	43	72.6	1.46	
South Bend	92	35	67.4	2.25	
Syracuse	96	33	68.4	2.04	T.
Terre Haute	91	40	69.4	3.32	
Topeka	91	35	66.2	1.00	
Valparaiso	90	39	66.6	T.	
Veedersburg	93	34	69.4	2.19	
Vevay	97	48	76.0	0.30	
Vincennes	97	42	74.3	3.63	
Washington	92	42	72.2	5.63	
Winamac	93	31	68.4	2.09	
Worthington	97	38	72.0	3.15	
Indian Territory.					
Bengal	101	58	79.0	4.59	
Claremore	98	53	73.4	5.17	
Colbert				4.29	
Fairland	97	51	75.0	7.32	
Hartshorne	101	56	80.4	2.94	
Healdton	103	53	78.6	4.52	
Lehigh	103	54	79.6	4.98	
Muscogee	100	54	77.6	3.54	
Pauls Valley	98c	51c	76.5c	4.98	
Ryan	98	56	78.8	8.39	
South McAlester				4.77	
Tahlequah	95	59	77.4	11.86	
Tulsa				4.83	
Wagoner	99	52	78.0	5.96	
Webbers Falls	99	59	78.7	2.13	
Iowa.					
Afton	92	35	65.0	5.96	
Akron	94	33	64.7	6.95	
Albia	92	33	64.1	3.92	
Algona *1	89	35	62.7	5.42	
Alta *a*	89	33	62.0	5.34	
Amana	91	37	65.1	4.39	
Ames *b*	93	36	66.0	7.12	
Ames (near)				6.48	
Atlantic	93	29	64.4	3.68	
Bancroft	90	32	61.6	6.82	
Batavia				4.10	
Baxter	93	33	64.8	3.68	
Bedford	96	30	67.0	3.04	
Belknap	94	36	66.4	3.85	
Belleplaine	91	34	64.0	5.12	
Bonaparte	95	36	68.2	5.87	
Britt	91	30	61.6	6.76	
Buckingham				3.79	
Bussey				4.24	
Carroll	93	32	63.2	4.65	
Cedar Rapids	95	38	66.0	2.83	
Chariton	93	34	65.5	5.15	
Charles City	92	35	62.4	6.75	
Clarinda	96	33	66.8	3.64	
Clearlake	92	38	63.7	4.80	
Clinton	93	36	65.5	4.61	
Iowa—Cont'd.					
College Springs	95i	34	68.1c	2.98	
Coon Rapids	91	36	63.8	6.78	
Council Bluffs	96	38	66.0	3.57	
Crawfordsville				5.04	
Cresco	91	32	61.0	6.29	
Cumberland				4.63	
Danville				4.69	
Decorah	95	34	62.3	4.00	
Delaware	90	34	62.9	3.63	
Denison	91	30	63.7	3.64	
Desoto	90	38	64.8	3.57	
Dows	93	30	62.9	5.28	
Eldon	96	38	68.0	3.81	
Elkader	95	33	64.2	3.99	
Emerson				3.06	
Emmetsburg				6.08	
Estherville	89	30	61.4	7.25	
Fairfield	94	33	66.4	4.54	
Fayette	93	31	63.8	3.72	
Fonda	98	25	63.0	5.51	
Forest City	91	33	61.6	6.79	
Fort Dodge	92	30	63.3	6.00	
Fort Madison				3.97	
Galva				7.04	
Gilman				3.74	
Glenwood	96	35	66.0	2.33	
Grand Meadow *1	90	38	61.5	3.19	
Greene	93	33	63.3	5.16	
Greenfield	91	33	64.0	4.67	
Grinnell	91	32	64.4	4.39	
Grinnell (near)	94	38	65.2	4.99	
Grundy Center	91	33	63.8	8.54	
Guthrie Center	100	36	66.4	5.10	
Hampton	95	35	63.5	6.86	
Harlan	92	30	63.6	3.91	
Hawkeye				4.17	
Hedrick	93	34	65.6	4.49	
Hopeville	92	36	66.1	5.26	
Hoprig				3.28	
Humboldt	93	33	63.7	5.05	
Independence	92	34	63.1	6.15	
Indianola	92	36	66.0	4.03	
Iowa City	93	37	66.2	4.35	
Iowa Falls	92	32	62.0	5.17	
Keosauqua	95	39	68.2	4.90	
Knoxville	93	35	65.3	5.36	
Lacona				5.80	
Lansing	95	34	65.0	3.55	
Larchwood	90	30	62.1	3.80	
Larrabee	91	29	61.6	6.24	
Leclaire				2.48	
Lemars	90	31	63.1	7.01	
Lenox	90	37	66.3	4.14	
Logan	93	31	63.0	4.09	
Maple Valley				5.12	
Maquoketa	91	34	64.6	4.62	
Marshalltown	93	34	65.1	5.35	
Monticello	94	32	64.2	3.47	
Mooar	93	36	63.5	4.01	
Mountayr	96	36	67.6	3.61	
Mount Pleasant	94	37	67.2	4.58	
Mount Vernon *b*	92	33	65.0	3.37	
Murray				5.07	
New Hampton	92	36	62.2	4.16	
Newton	92	34	64.8	3.73	
Northwood	91	34	60.6	5.60	
Odebolt	95	30	64.8	4.21	
Ogden	92	34	64.6	6.86	
Onawa	93	36	65.6	6.96	
Osage	90	34	60.6	5.53	
Osceola	93	36	66.4	6.78	
Oskaloosa	94	34	65.7	4.37	
Ottumwa	94	37	67.5	6.15	
Ovid	95	33	66.2	5.40	
Pacific Junction	95	35	65.7	3.72	
Pella	93	35	64.8	5.57	
Plover	94	31	63.3	4.46	
Primghar	91	32	60.4	5.55	
Redoak	94	35	67.8	4.19	
Ridgeway	92	36	63.4	6.88	
Rockwell City	92	34	62.8	4.54	
Ruthven	90	32	62.8	6.82	
Sac City	91	32	63.2	3.84	
Scranton	91	35	63.8	6.58	
Sheldon	89	31	61.8	6.95	
Sibley	91	29	61.7	5.91	T.
Sigourney	97	35	67.0	6.71	
Sioux Center	89	26	63.0	7.22	
Spirit Lake	91	35	62.6	8.82	
Storm Lake	88	32	62.8	5.33	
Thurman	93	37	66.2	2.94	
Toledo	94	34	65.8	4.37	
Villisca	98	30	67.5	4.03	
Vinton *1	93	38	63.8	2.77	
Wapello	99	38	68.2	4.51	
Washington	95	34	64.6	4.76	

TABLE II.—*Climatological record of voluntary and other cooperating observers*—Continued.

Stations.	Temperature. (Fahrenheit.)			Precipitation.	
	Maximum.	Minimum.	Mean.	Rain and melted snow.	Total depth of snow.
Iowa—Cont'd.	°	°	°	Ins.	Ins.
Washta	......	......	......	7.47	
Waterloo	94	35	64.0	5.48	
Waverly	94	36	63.8	4.18	
Westbend *[1]	92	34	61.2	4.55	
Westbranch	95	33	64.7	4.31	
West Union	......	......	......	2.87	
Whitten [d]	93	33	62.4	8.61	
Wilton Junction	92[d]	35[d]	65.0[d]	4.12	
Winterset	94	33	66.2	5.65	
Woodburn	......	......	......	4.86	
Kansas.					
Abilene	99	42	71.0	6.81	
Altoona	108	45	73.9	8.89	
Anthony	......	......	......	5.55	
Atchison *a*	96	44	69.4	7.05	
Baker	97	40	68.2	4.69	
Burlington	100	44	72.0	8.87	
Campbell	99	44	69.4	8.78	
Chanute	103	......	......	14.35	
Colby	98	33	66.5	2.01	
Columbus	96	48	73.0	5.58	
Coolidge	97	29	66.8	3.05	
Dresden	99	35	65.6	3.60	
Ellinwood	100	43	70.5	5.27	
Emporia	94	46	70.1	8.00	
Englewood	97	39	70.6	4.38	
Eureka	......	......	......	11.52	
Fallriver	102	43	72.8	12.07	
Fanning	94	39	69.0	5.43	
Fort Scott	100	47	73.1	8.26	
Frankfort	100	43	69.8	7.36	
Garden City	100	33	69.2	3.10	
Grenola	103	44	73.2	12.41	
Hays	102	37	69.2	2.98	
Horton	93	42	68.8	4.61	
Hoxie	100	35	68.8	3.00	
Hutchinson	101	39	70.4	6.32	
Independence	100	48	74.6	9.85	
Lakin	97	34	67.0	3.15	
Lawrence	92	45	70.1	8.26	
Lebanon	100	35	71.7	4.20	
Lebo	96	44	70.9	9.06	
Little River	100	43	71.1	8.33	
Macksville	98	40	70.0	6.46	
McPherson	102	40	70.8	8.35	
Madison	99	40	71.2	9.49	
Manhattan *b*	100	44	71.6	5.37	
Manhattan *c*	104	41	71.8	5.34	T.
Marion	97	43	72.2	6.15	
Medicine Lodge	99	41	71.7	8.10	
Minneapolis	101	40	71.1	4.77	
Moran	95	45	71.4	9.53	
Mounthope	......	......	......	5.29	
Ness City	101	40	71.1	4.65	
Newton	102	42	70.6	5.96	
Norwich	100	44	73.0	4.78	
Olathe	98	45	71.6	5.31	
Osage City	98	41	70.6	7.83	
Oswego	102	48	74.1	8.03	
Ottawa	95	43	70.8	6.42	
Phillipsburg	104	40	70.1	4.82	
Pratt	100	41	72.3	3.66	
Rome	100	44	73.3	7.59	
Salina	102	43	70.4	5.45	
Sedan	96	44	72.9	8.12	
Seneca	97	42	68.1	3.93	
Toronto	101	44	72.7	13.41	
Tribune	95	35	65.3	1.17	
Ulysses	100	31	67.4	1.97	
Valley Falls	85[l]	44	67.6[e]	8.73	
Viroqua	98	38	67.6	2.51	
Wakeeney (near)	90[l]	45[l]	65.4[l]	7.15	
Wallace	......	......	......	0.78	
Wamego *[1]	95	42	68.6	6.92	
Winfield	95	45	72.6	7.08	
Kentucky.					
Alpha *[8]	100	44	72.6	2.35	
Bardstown	100	40	75.8	0.85	
Blandville	95	46	75.8	3.21	
Bowling Green	95	46	76.0	4.41	
Burnside	......	......	......	4.19	
Canton *[1]	97	53	76.8	2.55	
Carrollton	97	50	75.6	0.80	
Catlettsburg	96	53	74.4	1.29	
Earlington	96	41	75.2	2.09	
Edmonton	99	40	74.9	3.01	
Eubank	95	41	72.6	3.75	
Falmouth	......	......	......	1.20	
Fords Ferry	101	37	75.9	3.03	
Frankfort	93	46	74.3	1.84	
Greensburg	98	39	74.2	1.66	
Henderson	94	45	74.4	3.13	
Hopkinsville	99	41	75.4	2.24	
Irvington	92	40	73.0	1.90	
Leitchfield	97	40	74.0	1.34	
Loretto	98	36	73.6	3.00	

Stations.	Temperature. (Fahrenheit.)			Precipitation.	
	Maximum.	Minimum.	Mean.	Rain and melted snow.	Total depth of snow.
Kentucky—Cont'd.	°	°	°	Ins	Ins.
Marrowbone	97	35	74.2	6.85	
Maysville	102	46	74.8	1.21	
Middlesboro	91	42	70.2	4.08	
Mount Hermon	92	42	72.6	3.57	
Mount Sterling	93	45	72.6	1.26	
Owensboro	93	44	74.0	1.84	
Owenton	100	43	75.2	1.33	
Paducah *a*	......	......	......	2.72	
Paducah *b*	101	51	78.6	2.05	
Pikeville	97	47	75.0	2.33	
Princeton	100	43	76.2	2.13	
Richmond	98	43	74.6	0.64	
St. John	94	40	73.2	1.37	
Scott	99	44	74.0	0.60	
Shelby City	97	38	72 0	1 66	
Shelbyville	99	42	74.6	2.07	
Vanceburg	98	45	72.1	1.00	
Warfield	95	44	72.8	1.90	
Williamsburg	97	45	75.2	2.67	
Louisiana.					
Abbeville	96	68	82.4	0.75	
Alexandria	101	66	83.0	2.28	
Amite	98	62	81.2	1.62	
Baton Rouge	98	65	81.6	3.82	
Burnside	97	64	80.3	5.42	
Calhoun	98	59	78.9	3.90	
Cheneyville	99	65	82 2	3.13	
Clinton	98	61	80.3	0.44	
Como *	102	58	80.8	2.10	
Covington	96	66	81.1	2.47	
Donaldsonville	102	68	82.9	2 95	
Emilie	97	68	80.4	4.50	
Farmerville	93	66	80.6	1.28	
Franklin	96	68	81.8	3.15	
Grand Coteau	97	63	81.2	1.56	
Hammond	101	61	82.0	1.44	
Houma	98	70	82.2	2.90	
Jeanerette	101	65	81.6	2.11	
Jennings	98	66	80 9	1.94	
Lafayette	99	63	81.8	1.45	
Lake Charles	98[d]	69[d]	82.6[d]	1.45	
Lake Providence	99	65	81.4	1.14	
L'Argent	93	64	81.3	0.20	
Lawrence	100	68	81.6	3.56	
Libertyhill	98	61	82.1	3.10	
Mansfield	98	62	80.6	2.07	
Melville	97	63	80.9	3.30	
Minden	104	63	82.3	2.13	
Monroe	102	60	82.0	2.01	
Montgomery	92	65	79.0	3.64	
Opelousas	98	63	81.0	2.46	
Oxford	98	62	80.4	0.75	
Paincourtville	99	65	81.6	2.70	
Plain Dealing	102	62	81.5	3.60	
Prevost [k]	96	69	80.4	4.24	
Rayne	101	62	82.3	1.15	
Robeline	98[j]	63	80.2[e]	2.20	
Ruston	100	67	81.8	3.56	
Schriever	100	62	81.5	3.26	
Shellbeach	97	70	82.2	3.10	
Southern University	97[e]	64[e]	78.6[e]	4.88	
Sugar Ex. Station	95	61	81.4	3.85	
Sugartown	95	70	82.2	0.54	
Venice	98	66	81.2	7.05	
Wallace	100	64	81.6	3.58	
White Sulphur Springs	......	......	......	2.25	
Maine.					
Belfast *[6]	83	36	60.2	3.05	
Bemis	88	28	58.2	3.06	
Calais	94	32	58.4	3.21	
Carmel	97	25	58.6	3.10	
Cornish *[1]	92	38	60.6	2 98	
Fairfield	89	32	59.0	2.55	
Farmington	96	28	59.4	4.82	
Flagstaff	91	25	55.6	2.35	
Gardiner	91	33	61.6	2.45	
Kineo	87	45	60.8	2.55	
Lewiston	97	38	62.4	2.48	
Mayfield	90	33	57.0	3.26	
North Bridgton	96	34	61.4	3.27	
Orono	93	27	59.2	2.94	
Rumford Falls	93	29	59.0	2.31	
Winslow	93	26	60.8	3.26	
Maryland.					
Annapolis	94	53	74.5	6.16	
Bachmans Valley	94	37	69.9	2.21	
Boettcherville	101	37	72.6	0.78	
Boonsboro *a*	99	42	73.2	2.18	
Charlotte Hall	100	42	74.3	4.79	
Chase	93	40	71.2	5.72	
Chestertown	89	47	72.2	7.48	
Chewsville	96	42	72.4	2.25	
Clearspring	94	43	71.5	1.09	
Coleman	......	......	......	5.15	
Collegepark	100	39	74.1	5.59	
Cumberland *a*	98	47	76.4	1.00	

Stations.	Temperature. (Fahrenheit.)			Precipitation.	
	Maximum.	Minimum.	Mean.	Rain and melted snow.	Total depth of snow.
Maryland—Cont'd.	°	°	°	Ins.	Ins.
Cumberland *b*	......	......	......	0.48	
Darlington	92	45	70.8	4.36	
Deerpark	89	29	65.0	0.40	
Easton	94	45	72.8	6.80	
Ellicott City	......	......	......	2.94	
Fallston	93	44	71.2	3.77	
Frederick	97	45	73.6	1.98	
Frostburg	94	40	67.0	1.67	
Grantsville	91	33	66.3	0.87	
Greatfalls	97	43	73.6	3.73	
Greenspring Furnace	97	40	72.0	2.16	
Hagerstown	99	40	73.8	1.55	
Hancock	103	38	73.0	1.19	
Harney	......	......	......	2.25	
Jewell	96	47	73.0	5.88	
Johns Hopkins Hospital	95	46	72.6	5.28	
Laurel	100	39	73.6	5.23	
McDonogh	93	42	70.9	3.22	
Mount St. Marys Coll	96	48	72.0	2.80	
Newmarket	96	41	71.8	1.84	
Pocomoke	93	46	73 6	......	
Princess Anne	94	33	72.1	1.68	
Rockhall *b*	91	43	72.6	8.23	
Smithsburg *a*	97	40	71.8	1.56	
Smithsburg *b*	96[e]	43[e]	71.8[e]	2.08	
Solomons	97	53	77.0	3.05	
Sudlersville	91	46	71.5	5.82	
Sunnyside	93	30	65.6	2.71	
Takoma Park	96	43	72.9	4.37	
Taneytown	97	39	72.8	2.72	
Van Bibber	89	47	70.1	6.78	
Westernport	96	37	69.2	0.94	
Westminster	90	43	72.2	......	
Woodstock	91	40	71.0	3.67	
Massachusetts.					
Amherst	87	35	63.4	3.40	
Bedford	89	38	63.3	4.22	
Bluehill (summit)	92	41	64 2	4.29	
Cambridge	92	38	64.9	4.54	
Chestnuthill	94	38	65.2	4.12	
Cohasset	......	......	......	4 92	
Concord	93	34	63.0	3.49	
East Templeton *[1]	85	41	62.3	4.56	
Fallriver	86	43	66.0	3.92	
Fiskdale	......	......	......	2.43	
Fitchburg *a* *[1]	86	44	62.6	4.13	
Fitchburg *b*	91	36	64.0	4.09	
Framingham	91	36	64.2	3.41	
Groton	89	35	62.8	4.12	
Hyannis *[1]	86	45	63.7	3.47	
Jefferson	......	......	......	2.77	
Lawrence	90	38	63.6	3.39	
Leeds	90	35	64.5	1.84	
Leominster	......	......	......	3.88	
Longplain	......	......	......	3.26	
Lowell *a*	90	39	65.0	4.20	
Lowell *b*	92	37	63.4	......	
Ludlow Center	84	30	60.8	3.18	
Middleboro	88	32	62.7	3.58	
Monson	88	36	63.9	2.08	
New Bedford *a*	87	42	65.2	4.19	
Pittsfield	85	34	63.6	1.89	
Plymouth	......	......	......	3.23	
Princeton	......	......	......	3.68	
Provincetown	88	46	66.5	3.24	
Salem	......	......	......	4.24	
Somerset *[1]	93	40	67.9	4.37	
South Clinton	......	......	......	3.85	
Springfield Armory	93	35	65.4	2.52	
Sterling	......	......	......	3.47	
Taunton *c*	86	32	62.2	5.08	
Westboro	92	35	64.9	3.06	
Weston	89	36	63.0	4.92	
Williamstown *[1]	84	40	63.2	1.21	
Winchendon	......	......	......	5.12	
Worcester *b*	88	38	64.1	2.21	
Michigan.					
Adrian	92	38	66.4	2.12	
Agricultural College	91	32	63.2	0.89	
Allegan	90	34	65.1	2.06	
Alma	91	34	64.0	2.11	
Ann Arbor	94	36	67.2	1.10	
Annpere	92	......	......	1.38	
Arbela	90	36	64.8	1.49	
Baldwin	92	30	63.8	3.72	
Ball Mountain	90	40	65.5	2.00	
Battlecreek	93	36	66.4	1.03	
Bay City	91	38	65.3	1.27	
Berlin	91	37	63.2	1.35	
Berrien Springs	93	35	65.8	0.70	
Big Point Sable *[10]	82	42	66.6	......	
Big Rapids	90	31	62.4	3.02	
Birmingham *	92	40	65.3	1.07	
Boon	87	31	58.8	4.97	
Calumet	78	36	56.0	12.85	T.
Carsonville	91	35	64.7	0.49	

TABLE II.—*Climatological record of voluntary and other cooperating observers.*—Continued.

Stations.	Temperature. (Fahrenheit.) Maximum.	Minimum.	Mean.	Precipitation. Rain and melted snow.	Total depth of snow.
Michigan—Cont'd.	°	°	°	*Ins.*	*Ins.*
Charlevoix	90	44	64.0	7.99	
Chatham	87	40	58.2	8.83	
Cheboygan	93	35	62.6	8.43	
Clinton	95	36	68.0	1.61	
Coldwater	93	32	66 6	1.16	
Deerpark	90	36	58.8	7.18	
Detour	81	40	60.4	7.15	
Dundee	92	38	67.2	1.43	
Eagle Harbor	87	38	58.3	10.00	
East Tawas	86	40	63.4	0.99	
Eloise	94	40	67.2	1.51	
Ewen	......	......	......	4.50	
Fairview	89	38	65.6	1.10	
Fitchburg	91	31	64.8	1.37	
Flint	90	35	64.2	1.60	
Frankfort	87	50	63.4	......	
Gaylord	89	32	60.4	5.80	
Gladwin	89	33	63.4	1.10	
Grand Rapids	93	39	66 1	1.87	
Grape	94	37	67.2	1.56	
Grayling	88	32	60.6	5.50	
Hanover	94	32	66.0	1.17	
Harbor Beach	92	36	64 1	0.94	
Harrison	87	38	62 3	3.39	
Harrisville	93	38	63.4	2.25	
Hart	91	36	63 6	2.18	
Hastings	92	32	64.6	1.44	
Hayes	90	36	62.2	2 05	
Highland Station	......	......	......	1.36	
Hillsdale	92	31	65.7	1.55	
Humboldt	84	19	52.0	8.48	0.8
Ionia	92	31	64.8	0.95	
Iron River	82	27	55.0	6.91	T.
Ishpeming	87	30	56.1	9.60	2.0
Ivan	88	34	59.8	6.01	
Jackson	95	36	67.7	1.17	
Jeddo	92	40	64 6	1.44	
Kalamazoo [f]	91	37	67.5	0.33	
Lake City	87	35	61.7	1.20	
Lansing	90	36	63.6	1.27	
Lathrop	84	31	55.4	7.55	
Lincoln	87	36	62.0	2.49	
Ludington	87	35	66.4	1.85	
Mackinac Island	83	37	60.3	7.17	
Mackinaw	87	34	61.9	12.44	
Madison	92	40	67.2	1.92	
Mancelona	89	34	62.2	5.40	
Manistique	82	37	59 4	5.67	
Menominee	87	34	64.3	4.86	
Middle Island *[10]	83	34	62 8	......	
Midland	90	34	62.6	1.05	
Mottville	93	30	65.2	0.99	
Mount Clemens	95	38	67.4	0.73	
Mount Pleasant	91	35	64 0	1.31	
Muskegon	89	37	62.6	1.62	
Newberry	85	30	51.4	2.41	
North Marshall	91	36	64 2	0.60	
Northport	90*	42*	63.8*	7 35	
Old Mission	92	44	63.3	4.47	
Olivet	87	39	64.4	1.05	
Omer	......	......	......	0.70	
Ontonagon	89	36	59.0	6.20	
Ovid	73	32	66.0	0.65	
Owosso	97	33	67.4	1.44	
Plymouth	......	......	......	1.14	
Port Austin	92	40	64 6	1.15	
Powers	88	30	59.8	3.25	
Reed City	89	35	65.2	3.41	
Roscommon	89	28	58 8	2.65	
Saginaw	92	37	65.8	1.31	
St. Ignace	84	37	60.2	7.40	
St. Johns [s]	91	37	64.3	1.48	
Sidnaw	86	28	55.4	7.61	T.
Somerset	91	40	66.2	1.00	
South Haven	90	33	65.2	1.28	
Stanton	92	34	65.0	2.44	
Thomaston	85	25	53.6	3.84	0.1
Thornville	90	39	64.9	1.39	
Traverse City	95	39	64.1	8.04	
Vassar	91	32*	63.9	1.43	
Wasepi	90	32	65.0	1.11	
Waverly	93	33	63.4	1.66	
Westbranch	88	40	62.6	2.29	
Wetmore	88	30	56.5	5.92	
Whitecloud	90	31	64.0	3.00	
Whitefish Point	79	37	58.5	8.99	
Ypsilanti	92	38	65.1	2.02	
Minnesota.					
Ada	90	26	56.2	6.08	
Albert Lea	91	36	60.9	6.93	
Alexandria	89	29	58.3	2.96	
Ashby	87	32	58.8	3.71	
Beardsley	94	28	61.2	3.52	
Bemidji	89	30	57.0	6.19	
Bird Island	93	29	61.8	9.78	
Blooming Prairie	92	31	60.4	6.35	
Minnesota—Cont'd.	°	°		*Ins.*	*Ins.*
Brainerd	91	31	59.4	2.43	
Caledonia	91	35	61.3	6.28	
Campbell	89	39	57 6	3.96	
Collegeville	88	35	60 4	4.65	
Crookston	91	30	56 8	5.08	
Currie	93[j]	30[j]	61.8[j]	6.08	
Deephaven	......	......		9.06	
Detroit City	89	24	56.0	5.12	
Faribault	90	32	61.4	7.64	
Farmington	90	32	59.7	8.13	
Fergus Falls	88	31	58.0	4.27	
Glencoe	90	24	58.4	7.50	
Grand Marais	......	......	......	9.05	
Grand Meadow	93	32	61.2	6.30	
Hallock	86	30	55.2	15.30	
Hovland	......	......	......	7.68	
Lake Jennie	93	31	61.6	7.44	
Lakeside	90	29	60 2	8.09	
Lake Winnibigoshish	85	35	56.8	9.40	
Leech [1]	87	35*	55.0	3 30	
Leroy	..	34	......	5 98	
Long Prairie	89	26	58.5	3 26	
Luverne	87	30	58.9	7 58	
Lynd	......	......	......	4.46	
Mapleplain	90	33	60.4	9 71	
Milaca	95	32	58.4	2.71	
Milan [g]	91	24	57.2	3.96	
Minneapolis *a*	92	33	60.0	7 53	
Minneapolis *b* [1]	91*	33	60.5	7.85	
Morris	90	32	60.2	2 33	
Mount Iron	86	28	55 2	10 03	
Newfolden	88	27	54.4	10 49	
New London	93	29	59.4	4.95	
New Richland *[1]	92	34	60.9	......	
New Ulm	93	32	61.8	7.17	
Park Rapids	89	28	56.2	4.34	
Pine River	87	34	58 0	5.44	
Pipestone	87	29	59.6	6.82	
Pleasant Mounds	91	33	60.8	8.06	
Pokegama Falls	87	28	55.7	6.79	
Redwing	......	......	......	6.70	
Reeds	......	......	......	7.36	
Rolling Green	88	34	61.3	8.58	
St. Charles	92	34	61.1	8.00	
St. Cloud	92	35	61.8	7.12	
St. Peter	91	31	61.0	7.92	
Sandy Lake Dam	85	32	57.6	2.34	
Shakopee	92	35	62.2	7.07	
Thief River Falls	......	......	......	4.70	
Tower	86	......	......	6.41	
Two Harbors	77	29	55.8	7.14	
Wabasha *[1]	93	40	62.9	6.60	
Willmar	88	30	60.2*	5.43	
Willow River	90	30	58.5	4.33	
Winnebago City	91	32	60.8	6.19	
Worthington	85	32	60.4	8.07	
Zumbrota [1]	90*	32	61.3	......	
Mississippi.					
Aberdeen	95	50	76.8	0.65	
Agricultural College	99	55	81.4	0 63	
Austin	95	51	78.2	3.38	
Batesville	96	50	77.3	4 22	
Bay St Louis	96	68	81.0	8.51	
Biloxi	98	68	81.9	7.15	
Booneville	94	50	77.0	2.04	
Canton	101	57	80.2	1.83	
Columbus *a*	......	......	......	2.18	
Columbus *b*	95	57	79.4	2 16	
Corinth	96	50	77.8	2.07	
Crystalsprings	99	59	80.4	1.80	
Edwards	98	62	81.8	1.34	
Fayette	97	63	80.0	0.85	
Fayette (near) *[1]	98	70	82.1	......	
Greenville *a*	95	60	80.2	2.75	
Greenville *b*	98	58	80.6	2.58	
Greenwood	96	61	80.8	1.83	
Hattiesburg	95	70	84.5	2.38	
Hazlehurst	101	62	81.4	1.42	
Hernando	94	54	79.2	1.28	
Holly Springs	93	54	78.2	2.65	
Jackson	101	54	77.8	1.08	
Kosciusko	102	56	79.6	3.70	
Lake	94	53	76.2	1.30	
Latonia	98	60	80.6	5.41	
Leakesville	......	56	......	5.92	
Logtown	99	65	80.2	6.18	
Louisville	99	54	78.8	1.05	
Macon	97	54	79.0	0.78	
Magnolia	97	62	80.5	1.13	
Natchez	100	67	82.8	1.80	
Okolona	98	51	78.8	1.10	
Palo Alto	96	56	79.8	1.78	
Pontotoc	96	52	78.5	2.70	
Port Gibson	101	59	8[illegible].9	1.09	
Ripley	94	51	78.4	3.30	
Shoccoe	95	62	80.9	1.77	
Mississippi—Cont'd.	°	°	°	*Ins.*	*Ins.*
Stonington *[1]	95	66	81.4	......	
Thornton	......	......	......	2.30	
Tupelo	......	......	......	2.28	
Walnutgrove	97*	62*	80.2*	0.65	
Watervalley	......	......	......	2.23	
Waynesboro	91	58	77.7	5.05	
Woodville	98	67	81.5	0.97	
Yazoo City	100	59	81.0	1.75	
Missouri.					
Appleton City	98	48	73.4	6.31	
Arthur *[3]	......	52	70.2	6.45	
Avalon	98	37	69.4	4.69	
Bethany	95	29	67.4	5.01	
Birchtree	91	45	73.6	3 20	
Boonville	......	......	......	4.15	
Brunswick	92	43	68.6	4.90	
Carrollton	93	42	69.4	4.56	
Conception	89	40	67.4	1.78	
Cook Station	97	40	72.6	2.80	
Cowgill *[5]	92	40	68 6	5.81	
Darksville	97	39	69.2	3.10	
Downing	......	......	......	5.83	
East Lynne *[3]	......	46	68.0	6.47	
Edgehill *[5]	90	42	71.2	1.18	
Edwards	95	46	72.0	4.51	
Eldon	93	41	71.0	4.35	
Elmira	96	38	69.3	6.51	
Fairport	......	......	......	3.61	
Fayette	95	42	70.8	4.76	
Galena	......	......	......	4.08	
Gallatin *[1]	96	40	69.4	5.47	
Gayoso	93	47	76.0	5.38	
Glasgow	92	42	70.2	4.61	
Gorin	......	......	......	3.81	
Halfway	93	47	72.6	6.67	
Harrisonville	96	43	70.2	5.70	
Hazlehurst	......	......	......	4.30	
Hermann	......	......	......	5.04	
Houston	91	42	71.6	5 87	
Houstonia (near)	......	......	......	5.11	
Irena	......	......	......	4.06	
Ironton	95	39	71.8	1.70	
Jackson *[3]	93	51	71.6	4 39	
Jefferson City	95	40	71.4	4.29	
Kidder	94	37	68.6	8.15	
Koshkonong	93	51	75 4	2.97	
Lamar	99	48	74.4	5.02	
Lamonte	......	......		6 50	
Lebanon	91	50	72.6	4.48	
Lexington	97	41	71.3	4.99	
Liberty	96	40	69.6	7.10	
Louisiana	97	38	70.9	4.32	
McCune *[1]	96	44	70.2	3.83	
Macon	96	37	70.4	5.33	
Marblehill	96	40	73.6	5.81	
Marshall	92	39	68 2	6.61	
Maryville	96	38	67.0	3.80	
Mexico	98	39	71.2	3.12	
Miami *[5]	91	43	70.0	4.21	
Mineralspring	89	46	70 1	5.69	
Montreal	90	47	71.6	3.47	
Mount Vernon	98	53	74.7	9.24	
Neosho	94	47	73.0	10.57	
Nevada	......	......	......	7.11	
New Haven	95	44	72.7	4.65	
New Madrid	94	......	......	5.67	
New Palestine	92	42	70.2	4.76	
Oakfield	96	41	73.2	3 81	
Olden	90	46	71.6	3.41	
Oregon *a*	93	41	68.4	5.38	
Oregon *b*	97	42	71.4	4.94	
Palmyra *[5]	94	38	69.7	3.83	
Phillipsburg *[1]	89	49	71.0	6.53	
Pickering *[3]	......	33	63.5	5 24	
Pine Hill	......	......	......	3 28	
Poplarbluff	96	47	75.7	3.32	
Potosi	94	38	70.9	1.64	
Princeton	100	35	67.6	5 24	
Richmond	93	44	70.0	5.56	
Rockport	......	......	......	3.51	
Rolla	......	......	......	3.04	
St. Charles	97	41	72.4	4.53	
St Joseph	......	......	......	5.12	
Sarcoxie *[4]	......	52	70.2	5.41	
Sedalia	......	......	......	4.16	
Seymour	90	48	70.8	4.83	
Shelbina	......	......	......	6.40	
Sikeston	98	44	75.8	3.75	
Steffenville	97	36	69.6	4.32	
Sublett	95	34	67.4	5.32	
Trenton	92	38	68.8	4.19	
Unionville	98	38	69.4	4.78	
Vichy	98	44	71.4	3.96	
Warrensburg	......	......	......	4.63	
Warrenton	96	40	71.0	5.99	
Wheatland	......	......	......	5.62	

TABLE II.—*Climatological record of voluntary and other cooperating observers*—Continued.

Stations.	Temperature. (Fahrenheit.) Maximum.	Minimum.	Mean.	Precipitation. Rain and melted snow.	Total depth of snow.
	°	°	°	*Ins.*	*Ins.*
Missouri—Cont'd.					
Willowsprings	91	43	71.6	2.82	
Windsor	93	42	70.3	3.84	
Wylie	95	48	74.4	6.26	
Zeitonia	99	45	75.6	1.36	
Montana.					
Billings	94	21	57.6	......	
Boulder	81	9	48.2	1.17	T.
Bozeman	84	19	53.1	1.24	
Butte	78	20	51.3	1.40	
Canyon Ferry	85	19	54.6	2.30	0.3
Chinook	84	20	53.6	2.22	T.
Columbia Falls	80	23	52.6	3.70	
Corvallis	83	30	56.4	0.90	
Crow Agency	88	20	56.8	0.99	0.5
Dell	......	13[4]	......	0.45	
Dillon	91	12	52.2	1.34	T.
Ekalaka	100	25	60.3	1.87	T.
Fort Logan	80	14	48.8	1.31	
Glasgow	86	24	53.6	0.83	
Glendive	94	22	55.6	2.90	T.
Glenwood	85	13	52.0	2.20	
Greatfalls	79	22	54.1	1.17	0.7
Kipp	81	15	48.4	2.69	7.5
Lewistown	85	9	51.8	0.80	T.
Livingston	83	23	56.7	0.90	
Manhattan	85	12	53.6	0.28	
Martinsdale	86	8	51.4	0.46	0.5
Missoula	89	26	55.4	2.25	
Parrot	85	20	53.4	0.80	
Plains	88	22	55.0	2.30	
Poplar	86	22	55.3	2.52	
Redlodge	85	16	49.6	......	
Ridgelawn	90	19	54.8	3.28	
St. Pauls	84	18	53.0	1.41	T.
Troy	87	23	56.2	2.26	
Twin Bridges [4]	87	15	51.4	......	
Utica	87	13	51.6	0.82	1.0
Yale	88	12	52.6	0.33	T.
Nebraska.					
Agate	......	......	......	2.29	
Agee	......	......	......	2.76	
Albion	96	33	64.3	3.73	
Alliance	......	......	......	1.00	T.
Alma	100	33	68.7	2.02	
Ansley	98	33	63.7	2.91	
Arapaho *[1]	92	38	70.8	1.30	
Arborville *[1]	96	40	64.8	7.81	
Arcadia	......	......	......	0.54	
Arlington	......	......	......	5.45	
Ashland *a*	97	39	67.6	2.76	
Ashland *b*	......	......	......	3.55	
Ashton	......	......	......	2.09	
Auburn	95	41	67.8	3.96	
Aurora *[1]	97	42	66.2	6.15	
Beatrice	99	36	68.4	3.80	
Beaver	104	36	69.2	1.67	
Bellevue	......	......	......	3.64	
Benedict	......	......	......	7.98	
Benkleman	......	......	......	0.06	
Blair	94	39	64.8	4.73	
Bluehill	......	......	......	5.50	
Bradshaw	......	......	......	8.87	
Brokenbow *[1]	90	36	63.4	1.32	
Burchard	......	......	......	2.67	
Burwell	......	......	......	1.38	
Callaway	94	31	62.0	1.90	
Camp Clarke	94	27	61.2	0.82	T.
Central City	......	......	......	6.26	
Chester	......	......	......	2.61	
Cody	......	......	......	0.30	
Columbus	90	38	62.5	7.95	
Crete	95	40	67.0	2.47	
Culbertson	......	......	......	0.70	
Curtis	98	40	66.5	1.04	
David City	95	41	64.6	4.40	
Dawson	99	40	70.6	2.62	
Eden	......	......	......	3.77	
Edgar *a*	......	......	......	3.11	
Ericson	......	......	......	1.95	
Ewing	......	......	......	2.56	
Fairbury	101	36	67.8	3.73	
Fairmont	98	39	66.2	4.90	
Fort Robinson	96	33	60.3	4.00	
Franklin	100	39	67.0	5.08	
Fremont	95	37	63.9	4.81	
Geneva	105	42	67.1	6.15	
Genoa	97	40	65.2	10.45	
Gering	93	30	61.4	1.50	T.
Gordon	......	......	......	1.00	
Gosper	......	......	......	2.00	
Gothenburg	97	34	65.1	1.15	
Grand Island *a*	......	......	......	4.39	
Grand Island *b*	100	38	66.2	5.08	
Greeley	......	......	......	2.30	
Guide Rock	......	......	......	4.97	
Haigler	......	......	......	0.00	

Stations.	Temperature. (Fahrenheit.) Maximum.	Minimum.	Mean.	Precipitation. Rain and melted snow.	Total depth of snow.
	°	°	°	*Ins.*	*Ins.*
Nebraska—Cont'd.					
Hartington	97	33	62.0	4.09	
Harvard	95	39	66.0	6.37	
Hastings *[1]	98	40	64.7	4.11	
Hay Springs	95	27	59.8	2.39	T.
Hebron	99	37	68.5	3.02	
Hickman	......	......	......	2.55	
Holdrege *[1]	92	45	71.4	2.40	
Hooper *[1]	94	40	62.9	5.18	
Imperial	102	28	65.6	0.13	0.2
Johnstown	......	......	......	0.25	
Kearney	......	......	......	2.10	
Kennedy	95	23	62.2	0.38	T.
Kimball	90	32	58.8	1.56	......
Kirkwood *[1]	93	38	62.6	0.72	
Laclede	98	39	65.4	7.10	
Lexington	95	34	64.2	2.71	
Lincoln *d*	97	41	65.2	1.95	
Lodgepole	94	30	60.5	T.	T.
Loup	......	......	......	2.81	
Lynch	95	32	61.0	2.85	
Lyons	......	......	......	6.47	
McCook *[1]	96	36	67.3	0.64	
McCool	......	......	......	5.85	
Madison	94	39	63.4	7.73	
Madrid *[5]	101	28	65.2	T.	T.
Marquette	......	......	......	5.51	
Merriman	......	......	......	0.00	
Minden *a*	100	37	66.3	4.16	
Monroe	......	......	......	10.20	
Nebraska City *b*	......	......	......	3.04	
Nebraska City *c*	94	38	67.8	3.61	
Nemaha *[1]	96	45	66.5	4.08	
Nesbit	98	30	62.4	0.15	1.0
Norfolk	97	34	63.0	4.78	
North Loup	100	30	65.7	2.11	
Oakdale	98	34	63.4	3.14	
Odell	100	44	71.6	4.63	
O'Neill	101	34	62.8	1.94	
Ord	......	......	......	1.57	
Osceola	......	......	......	7.41	
Ough	......	......	......	0.00	
Palmer	......	......	......	5.00	
Palmyra *[1]	96	42	66.0	2.94	
Plattsmouth *b*	......	......	......	2.79	
Pleasanthill	......	......	......	3.58	
Ravenna *a*	98	36	66.3	2.43	
Ravenna *b*	......	......	......	2.30	
Redcloud *b* *[1]	98	38	67.0	3.92	
Republican *[1]	98	40	68.0	3.35	
Rulo	......	......	......	0.65	
St. Libory	......	......	......	3.51	
St. Paul	101	31	64.8	3.55	
Salem *[1]	92	45	69.4	2.76	
Santee	101	30	65.0	2.44	
Sargent	......	......	......	2.57	
Schuyler	......	......	......	7.05	
Seneca *[1]	92	34	61.6	0.00	
Seward	......	......	......	5.30	
Smithfield	......	......	......	2.02	
Sprague	......	......	......	0.68	
Springview	94	30	61.4	0.28	
Stanton *[1]	94	38	62.8	3.33	
State Farm	98	39	67.8	2.61	
Strang	......	......	......	3.67	
Stratton	......	......	......	0.37	
Superior *[5]	98	40	69.0	2.90	
Syracuse	......	......	......	3.95	
Tablerock	......	......	......	2.79	
Tecumseh *b*	99	40	70.2	3.59	
Tecumseh *c*	......	......	......	4.09	
Tekamah	97	38	65.6	5.29	
Turlington	95	40	67.0	3.01	
Valparaiso	......	......	......	3.81	
Wakefield	96	32	63.8	6.45	
Wallace	......	......	......	0.00	
Wauneta	......	......	......	T.	
Weeping Water *[1]	92	36	62.9	2.67	
Westpoint	94	40	66.8	6.56	
Whitman	......	......	......	0.00	
Wilber *[1]	100	42	68.8	2.53	
Winnebago	......	......	......	7.55	
Wisner	......	......	......	8.78	
Wymore	......	......	......	4.39	
York	......	......	......	4.70	
Nevada.					
Austin	78	27	53.6	0.15	
Battle Mountain *[1]	96	31	58.5	0.00	
Belmont	75	24	51.4	0.37	T.
Beowawe *[1]	75	40	54.3	0.00	
Candelaria	83	29	57.2	0.20	
Carlin *[1]	90	20	56.9	0.00	
Carson City	87	22	55.1	0.09	
Clover Valley	......	......	......	0.32	
Cranes Ranch	......	......	......	0.20	
Duck Valley	82	20	52.9	0.76	
Elko *[1]	81	24	50.1	0.03	

Stations.	Temperature. (Fahrenheit.) Maximum.	Minimum.	Mean.	Precipitation. Rain and melted snow.	Total depth of snow.
	°	°	°	*Ins.*	*Ins.*
Nevada—Cont'd.					
Elko (near)	80	17	51.8	0.10	T.
Ely	78	22	50.4	1.35	T.
Empire Ranch	85	19	50.6	0.09	0.5
Fenelon *[1]	80	30	51.0	0.00	
Golconda *[1]	88	38	59.6	0.29	
Halleck *[1]	92	23	56.3	0.00	
Hawthorne	86	34	60.0	0.22	
Hot Springs *[1]	90	42	63.2	T.	
Humboldt *[1]	81	38	55.2	0.70	
Lee	......	......	......	0.19	T.
Lewers Ranch	89	26	56.2	0.87	
Los Vegas	99	42	72.4	0.00	
Lovelocks *[1]	89	42	62.6	0.45	
Martins	82	35	59.3	0.07	
Mill City *[1]	90	40	56.0	0.25	
Monitor Mill	81	21	50.0	0.78	2.0
Palisade *[1]	87	30	60.6	0.00	
Palmetto	79	22	52.0	1.20	4.5
Reno State University	86	28	55.8	0.67	
Silverpeak	92	32	62.4	T.	
Tecoma *[1]	87	30	59.4	T.	
Toano *[1]	85	28	52.4	T.	T.
Tybo	82	28	56.0	1.03	
Verdi *[1]	76	28	50.4	0.00	
Wadsworth *[1]	84	30	54.4	0.34	
Wells	......	......	......	0.02	T.
New Hampshire.					
Alstead	......	......	......	2.28	
Berlin Mills	99	28	59.0	4.78	
Bethlehem	86	32	58.3	4.16	
Brookline *[1]	90	34	62.9	4.66	
Claremont	93	29	62.6	1.75	
Concord	91	31	61.2	2.68	
Durham	93	32	62.0	3.30	
Grafton	92	27	59.3	2.39	
Hanover	91	29	61.2	1.35	
Keene	90	30	62.3	2.79	
Littleton	88	32	58.2	3.65	
Nashua	92	34	63.7	3.63	
Newton	90	31	60.9	5.81	
North Conway	97	31	61.0	1.78	
Peterboro	88	30	60.4	4.15	
Plymouth	93	29	60.2	1.61	
Sanbornton	92	32	60.4	3.54	
Stratford	91	28	59.4	4.33	
Warner	......	......	......	3.48	
New Jersey.					
Asbury Park	93	51	71.0	2.12	
Bayonne	95	46	71.4	3.03	
Belvidere	93	39	70.2	2.06	
Bergen Point	92	48	69.5	3.11	
Beverly	95	42	71.2	4.88	
Billingsport *[1]	89	52	71.0	7.37	
Bridgeton	98	45	73.0	1.76	
Camden	89	47	70.3	5.27	
Cape May C. H.	96	46	73.2	1.09	
Charlotteburg	92	33	63.8	2.16	
Chester	90	40	66.1	2.44	
Clayton	94	42	71.0	3.70	
College Farm	94	43	70.4	3.30	
Deckertown	91	36	67.8	1.87	
Dover	92	37	67.1	3.02	
Egg Harbor City	95	42	69.8	1.80	
Elizabeth	95	45	69.6	3.37	
Englewood	88	47	67.0	3.24	
Flemington	94	41	70.3	1.83	
Freehold	90	41	68.2	2.28	
Friesburg	93	44	71.4	3.00	
Hammonton	......	......	......	2.20	
Hanover	88	40	67.8	2.38	
Hightstown	90	46	69.4	3.97	
Imlaystown	91	44	71.2	2.12	
Lambertville	95	40	70.5	2.86	
Layton	95	32	67.0	1.55	
Lebanon	......	......	......	2.28	
Moorestown	93	44	70.8	5.58	
Mount Pleasant	......	......	......	1.30	
Newark	94	45	68.9	3.30	
New Brunswick	95	45	71.6	3.77	
Newton	92	38	68.2	2.24	
Ocean City	89	42	69.1	1.20	
Oceanic *c*	90	49	70.3	1.80	
Paterson	91	45	70.2	2.21	
Perth Amboy	93	46	70.6	3.26	
Plainfield	94	42	69.4	3.93	
Rancocas	......	......	......	5.11	
Rivervale	93	36	66.6	2.10	
Rocktown	......	......	......	3.02	
Roseland	94	36	67.3	2.82	
Salem	96	43	73.2	4.10	
Somerville	96	41	70.7	3.18	
South Orange	91	46	68.3	3.82	
Trenton	90	47	70.8	3.86	
Tuckerton	93	41	70.4	1.74	
Vineland	97	44	72.2	2.40	
Woodbine	91	44	70.8	1.87	

TABLE II.—*Climatological record of voluntary and other cooperating observers*—Continued.

Stations.	Temperature. (Fahrenheit.) Maximum.	Temperature. (Fahrenheit.) Minimum.	Temperature. (Fahrenheit.) Mean.	Precipitation. Rain and melted snow.	Precipitation. Total depth of snow.
New Mexico.	°	°	°	*Ins.*	*Ins.*
Albert	93	41	67.2	2.20	
Albuquerque	89	43	67.7	2.09	
Alma	86	38	63.4	2.72	
Aztec	85	30	62.2	1.18	
Bellranch	.....	.....	.....	1.97	
Bernalillo	89	41	67.4	1.68	
Bluewater	86	26	60.2	3.30	
Cambray	.....	.....	.....	1.78	
Deming	.....	.....	.....	3.10	
East Lasvegas	77	40	60.6	4.27	
Engle	94	39	69.7	1.74	
Espanola	87	34	63.8	3.27	
Folsom	86	30	60 2	2.14	
Fort Bayard	88	43	65.3	4.40	
Fort Stanton	83	40	62.8	6.06	
Fort Union	83	30	59.9	5.03	
Fort Wingate	89	32	60.9	1.06	
Gage	.....	.....	.....	3.13	
Galisteo	92	39	63.4	3.21	
Gallinas Spring	90	42	64.4	4.92	
Hillsboro	91	46	67.4	3.33	
Horse Springs	87	35	62.3	3.59	
Las Vegas Hotsprings	83	36	60.0	5.55	
Lordsburg	.....	.....	.....	2.71	
Lower Penasco	87[d]	46[d]	66.2[d]	5.45	
Lyons Ranch	98	44	70.0	5.55	
Mesilla Park	97	46	74.1	1.80	
Olio	87	30	62.4	0.63	
Raton	85	35	62 0	1.70	
Roswell	100	47	72.0	6.53	
San Marcial[1]	90	39	64.8	.....	
Socorro	95	43	70.4	1.75	
Springer	90	27	61.4	1.33	
Strauss	.....	.....	.....	2.02	
Whiteoaks	89	46	67.2	3.99	
Winsors Ranch	81	25	53.0	4.48	
Woodbury	89	42	65.4	2.01	
New York.					
Adams	.....	.....	.....	3.91	
Addison	94	33	65.6	1.01	
Akron	.....	.....	.....	2.86	
Alden	92	40	67.8	3.26	
Alfred	.....	.....	.....	1 51	
Angelica	91	29	62.8	1.47	
Appleton	96	43	65.4	2.58	
Atlanta	94	29	63.2	1.07	
Auburn	94	37	66.9	1.30	
Avon	95	35	64.7	1.77	
Axton	84[e]	27[e]	57.2[e]	3.59	
Baldwinsville	91	36	64.9	1.73	
Bedford *a*	.....	.....	.....	3.81	
Beedes	85	34	58.6	2.68	
Bisby Lodge	.....	.....	.....	3.67	
Blue Mountain Lake	.....	.....	.....	1.27	
Bolivar	91	28	61.8	2.18	
Bouckville	86	33	61.9	1.21	
Boyds Corners	.....	.....	.....	3.27	
Brockport	94	40	65.0	3.02	
Caldwell	86	37	62.8	0.81	
Canaan Four Corners	86	33	63.6	1.94	
Canajoharie	91	31	63.6	0.67	
Canton	91	31	60.2	4.90	
Carmel	96	43	67.6	3.54	
Carvers Falls	89	33	62.1	3.10	
Catskill	94	40	68.0	1.54	
Cedarhill	93	34	67.4	0.96	
Chenango Forks	.....	.....	.....	2.29	
Cooperstown	85	33	61.5	1.92	
Cortland	92	33	66.0	2.00	
Cutchogue	87	47	68.6	3.79	
Dekalb Junction	.....	.....	.....	4.46	
Easton	.....	.....	.....	1.63	
Elba	95	40	65.9	2.69	
Elmira	95	33	66.3	1.16	
Fleming	91	33	66.8	0.46	
Franklinville	90	32	62.2	2.09	
Fulton	.....	.....	.....	2.25	
Gabriels	84	30	56.8	4 65	
Glens Falls	88	38	63.0	0.94	
Gloversville	93	31	62.6	2.22	
Greenwich	89	36	64.4	2.39	
Griffin Corners	.....	.....	.....	2.09	
Haskinville	.....	.....	.....	1.46	
Hemlock	89	37	66.0	1.49	
Honeymead Brook	91	37	65.0	1.22	
Honnedaga Lake	.....	.....	.....	3.86	
Hoosick Falls	.....	.....	.....	1.35	
Humphrey	88	36	62.6	1.80	
Indian Lake	85[f]	37[f]	60.6[f]	1.89	
Ithaca	93	34	64.9	0.94	
Jamestown	89	40	63.9	2 52	
Jay	90	32	60.0	2.23	
Keene Valley	89	31	59.7	1.91	
King Ferry	.....	.....	.....	1.19	
King Station	.....	.....	.....	1.60	
Lake Pleasant	.....	.....	.....	3.56	
New York—Cont'd.	°	°	°	*Ins.*	*Ins.*
Liberty	87	38	64.6	3.60	
Littlefalls	90	33	63.0	2.31	
Lockport	.....	.....	.....	2.50	
Lowville	92	30	62.0	2.78	
Lyndonville	.....	.....	.....	2 46	
Lyons	92	47[c]	67.1	2.01	
Mayle	.....	.....	.....	2.28	
Meredith	84	32	60.5	2.48	
Middletown	90	40	66.4	2.23	
Mohonk Lake	89	41	64.6	3.55	
Moira	89	31	61.2	3.95	
Newark Valley	.....	.....	.....	2.28	
New Lisbon	86	27	59.8	2.33	
North Germantown	.....	.....	.....	2.26	
North Hammond	90	42	63.8	2.43	
North Lake	84	37	59.0	2.60	
Number Four	84	30	58.4	4.48	
Nunda	92	38	64.4	1.87	
Ogdensburg	89	37	63.3	2.90	
Old Chatham	.....	.....	.....	1.75	
Oneonta	91	35	65.5	2.44	
Oxford	90	29	62.1	2.53	
Palermo	86	30	61.0	2.57	
Penn Yan	96	35	67.2	0.41	
Perry City	95	32	63.4	1.07	
Phœnix	.....	.....	.....	1.37	
Plattsburg Barracks	89	38	62.3	2.14	
Port Byron	89	34	64.3	2.20	
Port Jervis	95	36	66.7	1.85	
Primrose	93	42	66.9	3.90	
Red Hook	.....	.....	.....	2.66	
Richmondville	82	35	61.7	1.34	
Ridgeway	93	44	65.6	2.92	
Rome	87	32	61.5	3.35	
Romulus	93	40	67.0	0.43	
Rose	.....	.....	.....	2.44	
St. Johnsville	92	31	63.8	1.34	
Salisbury Mills	.....	.....	.....	3.37	
Saranac Lake	86	31	57.4	4.51	
Saratoga Springs	88	36	63.2	0.78	
Schenectady	95	38	66.4	1.15	
Scottsville	.....	.....	.....	1.67	
Setauket	87	45	67.8	2.31	
Shortsville	96	40	65.8	1.74	
Skaneateles	.....	.....	.....	1.65	
South Canisteo	90	30	62.7	1.43	
Southeast Reservoir	.....	.....	.....	3.52	
South Kortright	88	29	61.2	2.50	
Straits Corners	93	.....	.....	1.91	
Ticonderoga	92	35	64.4	1.44	
Volusia	91	40	64 4	4.46	
Walton	91	32	64.0	3.26	
Wappingers Falls	95	37	66.4	2.35	
Warwick	.....	.....	.....	3.32	
Watertown	93	32	63.4	3.05	
Waverly	97	28	66.4	1.12	
Wedgwood	99	39	65.8	0.90	
West Berne	95	31	64.4	0.77	
West Chazy	91	38	61.2	.....	
Westfield *a*	90	45	66.4	2.61	
Westfield *b*	92	41	66.2	3.04	
Westfield *c*	88	46	67.5	4.18	
Williamson	.....	.....	.....	2.56	
Windham	89	29	62.2	1.87	
North Carolina.					
Abshers	98	46[i]	73.6[e]	5.46	
Asheville	.....	.....	.....	3.39	
Biltmore	89	44	69.9	2.51	
Bryson City	.....	.....	.....	3.02	
Chapelhill	100	49	76.7	3.40	
Cherryville	97	47	75.4	2.01	
Currituck	.....	.....	.....	0.84	
Edenton	93	53	76.1	1.68	
Fayetteville	99	52	77.0	2.77	
Goldsboro	94	51	75 3	3.88	
Greensboro	97	51	75.0	2.34	
Henderson	99	50	74.6	2.70	
Hendersonville	94	43	70.4	3.80	
Henrietta	97	49	76.0	1.05	
Horse Cove	84	45	69.4	6.74	
Kinston	99	49	76.6	2.30	
Linville	80	38	63.1	4.42	
Littleton	101	47	75.1	2.11	
Louisburg	97	50	75.5	2.27	
Lumberton	96	52	76.4	1.83	
Marion	100	48	75.2	3.48	
Marshall	92[f]	39[f]	69.6[f]	3.63	
Mocksville[d]	96	47	75.0	2.08	
Moncure	97	50	75.0	2.21	
Monroe	96	43	74.8	1.62	
Morganton	98	45	74.0	2.10	
Mountairy	94	49	71.7	4.12	
Murphy	.....	.....	.....	3.19	
Newbern	94	53	77.0	1.95	
Oakridge	99	46	73.6	4.10	
Patterson*[1]	94	44	68.8	2.88	
North Carolina—Cont'd	°	°	°	*Ins.*	*Ins.*
Pittsboro	97	47	74.3	3.67	
Rockingham	98	51	76.4	1.50	
Roxboro	98	49	75.6	1.52	
Salem	96	48	74.6	3.78	
Salisbury	99	48	77.2	1.60	
Saxon	100	46	74.1	3.18	
Selma	100	48	76.3	2.42	
Settle	98	51	75.8	3.56	
Sloan	95	47	75.4	2.20	
Soapstone Mount	96	44	72.9	1.47	
Southern Pines *a*	101	50	77.6	1.97	
Southern Pines *b*	98	52	77.0	2.00	
Southport	93	58	78.8	1.41	
Springhope*[1]	94	53	76.1	1.60	
Tarboro	100	47	77.0	1.05	
Washington	98[d]	54[d]	76.6[d]	1.04	
Waynesville	88	39	67.2	2.49	
Weldon *a*	97	51	74.5	2.29	
Weldon *b*	.....	.....	.....	2.18	
North Dakota.					
Amenia	92	29	57.0	3.73	
Ashley	88	17	55.0	1.41	
Berlin	86	22	55.2	5.26	
Buxton	88	29	55.0	7.15	
Churchs Ferry	83	29	52.8	4.87	
Coalharbor	86	23	54.6	7.08	
Devils Lake	94	30	56.6	4.54	
Dickinson	86	22	54.0	2.56	T.
Donnybrook	.....	.....	.....	6.29	
Dunseith	79	23	52.8	5.46	
Ellendale	90	26	58.4	4.86	
Falconer	88	24	56.2	5.80	T.
Fargo	90	26	56.5	3.27	
Forman[g]	89	27	59.6	3.20	
Fort Yates	98	17	58.8	4.47	
Fullerton	90	24	56.6	4.60	
Gallatin	90	22	58 4	4.06	
Glenullin	91	22	53.8	3.85	
Grafton	85	31	54.8	9.61	
Hamilton	96	30	54.4	6.07	
Hannaford	87	29	55.4	3.84	
Jamestown	93	27	55.6	5.31	
Langdon	87	28	52.8	6.31	
Larimore	91	28	54.2	5.60	
Lisbon	90	26	57.1	3.77	
McKinney	83	23	51.5	4.33	
Mayville	89	27	53.2	5.53	
Medora	89	23	55.7	2.51	T.
Melville	88	28	56.6	4.29	T.
Milton	78	30	51.4	7.30	
Minnewaukon	83	26	54.0	4.46	
Minto	88	30	55.6	9.72	
Napoleon	90	23	55.8	2.63	
New England	88	22	52.2	.....	
Oakdale	86	24	53 0	2.51	
Pembina	91	30	54.2	5.65	
Portal[g]	84	26	50.7	3.35	1.0
Power	90	22	57.4	2.88	
Sheyenne	93	27	54.6	4.31	
Steele	93	22	56.2	4.19	
Towner	83	25	53.0	9.33	
University	89	32	54.4	4.90	
Wahpeton	89	28	58.6	2.67	
Willow City	87	28	54.3	7.43	
Ohio.					
Akron	92	42	67.2	3.22	
Annapolis	96[g]	36[g]	68.6[g]	1.89	
Ashland	90	41	68.4	1.69	
Ashtabula	91[d]	48[d]	66.6[d]	2.00	
Atwater	.....	.....	.....	2.82	
Bangorville	92	40	68.7	2.25	
Bellefontaine	90	43	68.6	2.64	
Bement	92	39	63.0	2.26	
Benton Ridge	93	37	68.2	1.66	
Bethany	97	41	72.4	0.81	
Bigprairie	91	43	67.8	2 00	
Binola	.....	.....	.....	3.55	
Bladensburg	93	40	68.6	2.33	
Bloomingburg	93	43	71.0	2.14	
Bowling Green	93	35	68.0	0.85	
Bucyrus	95	40	69.0	2.10	
Cambridge	94	36	67.0	1.43	
Camp Dennison	96	45	73.2	0.68	
Canal Dover	93	40	67.9	2.86	
Canton	90	43	67.7	3.31	
Cardington	94	39	68.8	2.67	
Cedarville	.....	.....	.....	0.82	
Celina	95	34	68.2	1.51	
Chillicothe	99	44	73.2	1.53	
Circleville	95	45	71.0	0.72	
Clarksville	94	43	72.4	0.42	
Cleveland *a*	88	44	66.9	2.57	
Cleveland *b*	90	45	67.2	2.11	
Coalton	97	37	71.5	1.28	
Colebrook	92	.....	.....	2.83	
Dayton *a*	.....	.....	.....	1.16	

TABLE II.—*Climatological record of voluntary and other cooperating observers*—Continued.

Stations.	Temperature. (Fahrenheit.) Maximum.	Minimum.	Mean.	Precipitation. Rain and melted snow.	Total depth of snow.
	°	°	°	Ins.	Ins.
Ohio—Cont'd.					
Dayton *b*	99	44	72.8	0.99	
Defiance	94	35	67.2	1.07	
Delaware	94	43	69.6	0.62	
Demos	92	43	69.7	1.88	
Elyria	94	41	67.8	2.35	
Findlay	97	42	71.7	1.50	
Frankfort	93	42	70.4	2.05	
Garrettsville	94	34	65.1	1.80	
Granville	93	41	68.4	3.12	
Gratiot	91	43	69.2	1.53	
Green	99	45	73.3	1.95	
Greenfield	92	47	71.8	2.15	
Greenhill	91	36	66.0	2.83	
Greenville	90	42	68.5	3.65	
Hanging Rock	100	41	72.9	1.28	
Hedges	95	34	68.6	0.92	
Hillhouse	94	36	65.1	2.00	
Hillsboro	94	42	70.4	2.11	
Hiram	92	43	66.8	2.09	
Hudson	95	37	66.0	3.02	
Jacksonboro	98	43	73.6	0.45	
Kenton	96	43	72.8	1.52	
Killbuck	90	44	67.5	1.68	
Lancaster	94	44	70.6	1.33	
Leipsic	93	35	65.8	0.70	
Logan	......	39	......	0.80	
McConnelsville	98	43	71.0	1.11	
Mansfield	......	......	......	2.23	
Marietta	92	48	71.4	0.86	
Marion	95	42	70.4	2.99	
Medina	95	39	67.9	3.51	
Milfordton	92	42	68.0	2.43	
Milligan	97	35	69.6	0.92	
Montpelier	93	35	66.7	1.63	
Napoleon	92	38	68.8	1.34	
Neapolis	......	......	......	1.26	
New Alexandria	90	44	69.4	1.05	
New Berlin	93	40	67.8	2.12	
New Bremen	95	37	69.2	1.84	
New Holland	98	44	70.4	1.88	
New Paris	94	......	......	1.04	
New Richmond	100	45	74.8	0.82	
New Waterford	91	36	67.0	1.52	
North Lewisburg	93	42	69.2	1.25	
North Royalton	95	43	68.4	3.71	
Norwalk	92	40	67.4	1.32	
Oberlin	93	40	68.0	3.00	
Ohio State University	95	43	70.8	1.57	
Orangeville	90	33	63.8	1.10	
Ottawa	95	37	69.8	1.11	
Pataskala	95	43	70.0	1.82	
Perry	......	......	......	1.62	
Philo	96	42	70.5	0.32	
Plattsburg	92	41	70.4	4.12	
Pomeroy	96	44	71.5	1.60	
Portsmouth *a*	......	......	......	2.06	
Portsmouth *b*	97	49	73.6	2.06	
Pulse	......	......	......	0.76	
Richwood	98	43	72.5	1.08	
Ridgeville Corners	......	......	......	1.45	
Ripley	97	50	73.8	1.52	
Rittman	88	40	66.2	3.17	
Rockyridge	95	40	68.8	0.83	
Rosewood	92	39	68.8	3.41	
Shenandoah	91	41	67.0	2.21	
Sidney	97	43	71.0	2.53	
Sinking Spring	93	46	72.8	3.00	
Somerset	97	44	71.6	0.96	
Springboro	......	......	......	1.00	
Strongsville	......	......	......	3.56	
Thurman	98	43	73.6	0.30	
Tiffin	90	44	68.1	0.91	
Upper Sandusky	92	42	68.6	1.98	
Urbana	88	44	68.4	2.39	
Vanwert	94	39	69.8	1.55	
Vermillion	92	41	66.9	1.36	
Vickery	93	40	68.1	1.03	
Walnut	......	......	......	1.37	
Warren	93	35	66.4	1.20	
Warsaw	92	39	68.0	1.91	
Wauseon	96	35	68.9	1.61	
Waverly	99	45	73.8	0.76	
Waynesville	94	42	70.6	0.83	
Wellington	91	40	67.5	2.81	
Westerville	89	47	68.6	1.80	
Willoughby	......	......	......	2.26	
Wooster	89	41	67.1	2.19	
Youngstown	......	......	......	1.60	
Zanesville	......	......	......	0.80	
Oklahoma.					
Arapaho	101	42	74.1	7.58	
Beaver	100	......	......	4.28	
Blackburn	98	46	72.0	9.76	
Burnett	96	50	75.4	5.73	
Clifton	99	50	76.4	7.67	
Enid	96	48	73.8	6.70	
Fort Reno	99	46	73.1	11.41	
Fort Sill	100	52	76.6	9.00	
Hennessey	100	45	74.9	6.81	
Jefferson	103	44	73.7	9.04	
Jenkins	98	45	72.6	6.30	
Kingfisher	101	46	75.2	7.87	
Norman	97	51	75.6	6.77	
Prudence	107	39	74.5	6.07	
Sac and Fox Agency	99	......	......	8.00	
Stillwater	97	50	74.9	9.22	
Taloga	101	52	77.6	7.52	
Vittum	95	51	75.2	10.55	
Waukomis	105	46	74.9	7.30	
Wood	100	35	71.2	9.10	
Woodward	100	46	75.4	5.11	
Oregon.					
Albany *a* *[1]	86	46	62.5	2.72	
Albany *b*	......	......	......	2.55	
Alpha	90	35	59.3	2.83	
Arlington	89	50	65.8	0.26	
Ashland *b*	90	32	58.8	0.32	
Aurora *[1]	90	41	59.9	2.47	
Aurora (near)	88	37	57.8	2.79	
Bandon	69	41	57.2	0.77	
Bay City	80	37	56.6	2.90	
Brownsville *[1]	88	44	62.4	1.52	
Bullrun	76	40	56.2	4.89	
Burns	86	25	52.1	0.24	
Cascade Locks	88	40	59.8	3.00	
Comstock *[1]	85	36	58.7	2.70	
Coquille	......	......	......	0.70	
Corvallis	89	36	58.4	2.51	
Dayville	88	26	57.0	1.36	
Ella	......	......	......	0.37	
Fairview	89	40	56.0	2.42	
Falls City	85	37	56.8	2.89	
Gardiner	78	45	59.7	2.74	
Glenora	92	35	57.5	4.06	
Government Camp	79	31	49.0	5.81	
Grants Pass	95	32	60.0	0.70	
Happy Valley	83	18	50.0	1.78	
Hare	79	43	57.8	1.32	
Hood River (near)	91	34	60.0	1.89	
Jacksonville	94	36	60.4	0.33	
Joseph	82	23	51.6	1.86	
Junction City *[1]	86	40	60.2	2.54	
Kerby	97	29	59.6	0.86	
Lafayette *[1]	90	46	59.7	1.80	
Lagrande	86	30	57.5	1.17	
Lonerock	84	20	51.1	0.96	
McMinnville	91	35	58.1	2.00	
Merlin *[1]	90	44	62.7	0.95	
Monmouth *a* *[1]	85	42	59.0	3.22	
Monroe	85	39	59.3	2.47	
Mount Angel	87	40	58.4	2.90	
Nehalem	......	......	......	3.56	
Newberg	95	36	59.4	2.60	
Newbridge	89	18	55.4	0.50	
Newport	72	41	56.3	4.39	
Pendleton	93	30	62.3	0.85	
Placer	......	......	......	0.99	
Prineville	86	25	55.2	0.73	
Riddles *[1]	90	36	58.4	0.90	
Riverside [h]	85	27	57.6	0.61	
Sheridan *[1]	86	40	56.7	2.08	
Silverlake	90	13	53.2	0.49	
Silverton *[1]	82	46	60.6	2.58	
Siskiyou *[1]	70	36	53.9	0.30	
Sparta	81	24	52.7	2.06	
Springfield *[1]	86	43	58.7	3.46	
Stafford	91	40	59.8	3.09	
The Dalles	87	34	61.0	1.09	
Tillamook	......	......	......	1.34	
Toledo	85	36	57.6	2.82	
Umatilla	......	......	......	0.51	
Vale	86	22	57.1	0.60	
Westfork *[1]	86	32	57.3	1.80	
Weston	89	26	57.2	3.46	
Williams	89	31	56.9	0.64	
Pennsylvania.					
Altoona	94	35	68.1	1.48	
Athens	100	28	67.0	1.15	
Beaver Dam	......	......	......	1.28	
Bethlehem	......	......	......	1.22	
Brookville	......	......	......	2.49	
Browers Lock	......	......	......	2.55	
Butler	94	34	66.4	1.45	
Carlisle	93	40	70.3	1.09	
Cassandra	88	34	64.8	1.16	
Centerhall	90	37	67.8	0.88	
Chambersburg	95	37	70.0	0.56	
Coatesville	96	40	71.4	2.62	
Confluence	96	38	68.8	1.45	
Coopersburg	89	41	68.6	1.86	
Davis Island Dam	......	......	......	1.55	
Derry Station	100	37	72.0	0.84	
Pennsylvania—Cont'd.					
Driftwood	......	......	......	1.25	
Duncannon	......	......	......	2.60	
Dushore	89	27	62.7	1.13	
Dyberry	92	30	63.5	3.73	
East Bloomsburg	......	......	......	0.25	
East Mauch Chunk	92	35	68.1	1.20	
Easton	87	40	69.2	1.72	
Ellwood Junction	......	......	......	1.29	
Emporium	88	38	65.2	1.36	
Ephrata	94	39	71.6	1.33	
Forks of Neshaminy *[1]	88	48	67.6	3.07	
Franklin	92	39	66.2	3.09	
Freeport	......	......	......	1.03	
Girardville	......	......	......	1.22	
Greensboro	......	......	......	1.44	
Hamburg	......	......	......	1.60	
Hawthorn	95	37	68.1	2.52	
Hews Island Dam	......	......	......	0.89	
Huntingdon *a*	98	33	69.6	0.89	
Huntingdon *b*	......	......	......	0.64	
Irwin	......	......	......	0.58	
Johnstown	95	39	69.9	1.50	
Karthaus	......	......	......	0.28	
Keating	......	......	......	2.06	
Kennett Square	91	43	71.0	5.16	
Lawrenceville	96	27	63.5	0.95	
Lebanon	92	37	69.8	1.84	T.
Leroy	94	36	66.5	0.54	
Lewisburg	94	33	68.6	0.65	
Lockhaven *a*	93	37	69.8	0.61	
Lockhaven *b*	......	......	......	0.65	
Lock No. 4	......	......	......	0.48	
Lycippus	95	44	70.8	1.37	
Mifflin	......	......	......	0.20	
Oil City	......	......	......	2.96	
Parker	......	......	......	1.63	
Philadelphia	90	48	72.2	6.22	
Quakertown	92	38	68.8	1.65	T.
Reading [2]	......	......	69.7	1.27	
Renovo *a*	......	......	......	1.22	
Renovo *b*	92	39	67.6	1.34	
Saegerstown	94	35	64.6	2.81	
St. Marys	80	38	63.5	2.30	
Selinsgrove	94	34	69.2	1.59	
Shawmont	......	......	......	5.36	
Sinnamahoning	......	......	......	0.42	
Smethport	91	33	63.4	1.67	
Somerset	94	32	67.2	0.60	
South Eaton	91	33	66.4	1.84	
State College	93	37	68.0	0.63	
Sunbury	......	......	......	0.19	
Swarthmore	87	46	69.8	6.90	
Swiftwater	86	36	63.9	1.86	
Towanda	93	30	66.0	0.69	
Troutrun	......	......	......	0.75	
Warren	87	37	63.6	1.56	
Wellsboro	89	32	63.2	0.55	
Westchester	89	45	70.2	3.26	
West Newton	......	......	......	0.54	
Westtown [f]	89	42	67.2	3.38	
Wilkesbarre	93	35	68.2	0.52	
Williamsport	95	38	68.5	1.01	
York	94	36	70.4	3.18	
Rhode Island.					
Bristol	84	46	67.0	3.72	
Kingston	88	39	64.4	3.04	
Pawtucket	93	44	69.3	4.16	
Providence *a*	91	44	67.6	4.05	
Providence *c*	90	42	65.8	4.28	
South Carolina.					
Allendale	90	54	77.4	3.94	
Batesburg	98	54	77.8	4.71	
Beaufort	98	61	79.9	3.77	
Blackville	98	52	79.2	3.19	
Calhoun Falls	......	......	......	3.55	
Camden	......	......	......	1.65	
Cheraw *a*	100	52	78.0	1.55	
Cheraw *b*	......	......	......	1.37	
Clemson College	97	46	76.0	2.64	
Conway	......	......	......	2.61	
Darlington	......	......	......	3.59	
Edisto	......	......	......	1.72	
Effingham	......	......	......	2.20	
Florence	96	54	76.8	3.47	
Gaffney	......	......	......	2.17	
Georgetown	92	58	76.2	4.75	
Gillisonville	98	50	78.5	2.77	
Greenville	94	51	73.8	3.51	
Greenwood	94	52	76.2	2.45	
Holland	95	45	73.0	2.87	
Kingstree *a*	93	52	75.7	2.03	
Kingstree *b*	......	......	......	2.40	
Liberty	96	50	75.0	3.95	
Little Mountain	98	52	78.0	3.92	
Longshore	98	49	77.2	2.42	
Pinopolis *[1]	91	59	75.9	3.78	

TABLE II.—*Climatological record of voluntary and other cooperating observers*—Continued.

Stations	Temperature. (Fahrenheit.) Maximum.	Minimum.	Mean.	Precipitation. Rain and melted snow.	Total depth of snow.
South Carolina—Cont'd.	°	°	°	*Ins.*	*Ins.*
St. George	95	53	77.6	3.65	
St. Matthews	98	55	78.6	1.70	
St. Stephens	......	......	......	2.46	
Santuck	100	47	76.8	1.24	
Shaws Fork	99	50	78.4	1.62	
Smiths Mills	......	......	......	2.77	
Societyhill	94	55	76.8	4.35	
Spartanburg	96	47	74.8	2.11	
Statesburg	99	55	79.8	1.27	
Summerville	93	55	76.7	4.68	
Temperance *	100	48	78.2	1.08	
Trenton	94	59	79.0	2.17	
Trial	91	50	74.2	6.15	
Walhalla	93	45	73.2	4.28	
Winnsboro	93	54	75.6	1.55	
Winthrop College	97	52	77.4	1.78	
Yemassee	96	54	78.6	3.53	
Yorkville	100	54	79.4	1.70	
South Dakota.					
Aberdeen	93	22	61.8	3.25	
Academy	96	28	62.9	0.46	
Alexandria	93	25	59.6	2.08	
Armour	94	28	61.4	1.58	
Ashcroft	98	22	57.0	2.49	
Bowdle	89	22	56.1	1.34	
Brookings[1]	88*	25	58.4	4.97	
Centerville	......	......	......	3.44	
Chamberlain	98	29	63.6	0.92	
Clark	87	25	59.2	7.72	
Desmet	86	27	58.6	3.43	
Doland	89	23	59.8	3.51	
Elkpoint	96	34	65.4	10.50	
Farmingdale	......	......	......	2.17	
Faulkton	93	23	59.0	3.93	
Flandreau	90	26	60.5	5.00	
Forestburg	94	23	61.9	2.14	
Forest City	96	25	60.4	3.60	
Fort Meade	100	30	61.7	2.03	
Gannvalley	93	28	61.2	1.75	
Grand River School	......	23	......	5.54	
Greenwood	97	34	65.2	3.55	
Hartman	89	30	60.2	5.43	
Hitchcock	......	......	......	4.16	
Hotch City	97	23	61.9	1.05	
Hot Springs	96	38	64.0	3.50	
Interior	100	28	63.6	1.80	
Ipswich	87	20	57.8	4.10	
Kimball	98	29	62.0	0.47	
Leola	90	24	57.4	2.34	
Leslie	101	25	60.8	3.60	
Mellette	91	23	60.9	4.82	
Menno	90	28	62.0	2.50	
Millbank	93	27	60.7	3.28	
Mitchell	93	25	62.6	1.46	
Oelrichs	96	32	60.6	2.20	
Parker	92	29	62.2	3.73	
Plankinton	91	25	60.6	1.05	T.
Redfield	90	23	58.4	6.00	
Rochford	90	22	52.9	2.48	
Rosebud	93	27	60.4	1.50	
St. Lawrence	90	23	58.6	4.13	
Silver City	......	......	......	3.08	
Sioux Falls	90	23	60.8	4.06	
Sisseton Agency	88	28	59.2	5.80	
Spearfish	91	28	58.0	1.69	
Watertown	86	21	58.0	4.74	
Waubay	89	24	57.2	7.90	
Wentworth	89	27	60.5	5.24	
Wessington Springs	90	23	57.1	2.66	
Wolsey	......	......	......	1.99	
Tennessee.					
Andersonville	96	44	73.4	3.75	
Arlington	92	48	75.6	3.47	
Ashwood	95	43	76.5	2.50	
Benton	94	45	76.0	4.06	
Bluff City	......	......	......	3.16	
Bolivar	95	49	77.2	3.21	
Bristol	92	45	71.3	3.02	
Brownsville	94	50	77.0	3.93	
Byrdstown	95	42	74.4	3.00	
Carthage	95	......	......	3.94	
Clarksville	93	48	75.4	1.93	
Clinton	......	......	......	2.87	
Covington	94	51	78.0	4.22	
Dickson	93	44	75.8	2.12	
Dover	92[c]	42[c]	75.8[d]	2.67	
Dyersburg	95	50	77.2	7.33	
Elizabethton	95	42	72.2	3.05	
Elk Valley	96	40	72.0	4.97	
Erasmus	92	34	69.4	2.71	
Florence	92	46	75.2	3.07	
Franklin	95	47	75.1	2.13	
Grace *[1]	90	48	74.1	1.44	
Greeneville	94	41	71.8	2.25	
Harriman	94	44	74.0	5.54	
Hohenwald	92	39	73.2	2.52	

Stations.	Temperature. (Fahrenheit.) Maximum.	Minimum	Mean.	Precipitation. Rain and melted snow.	Total depth of snow.
Tennessee—Cont'd.	°	°	°	*Ins.*	*Ins.*
Iron City	93	43	75.6	4.10	
Jackson	92	52	77.0	......	
Johnsonville	97	51	76.0	2.04	
Jonesboro *[1]	89	52	70.7	3.00	
Kingston	......	......	......	3.06	
Lafayette *[5]	96	43	75.1	6.98	
Lewisburg	96	43	76.4	2.20	
Lynnville	94	48	76.3	2.22	
McKenzie	96	48	77.2	3.70	
McMinnville	97	37	75.4	2.40	
Maryville *[5]	98	47	76.3	2.57	
Milan	95	47	77.0	6.45	
Newport	93	45	74.0	1.88	
Nunnelly	95	41	74.4	2.76	
Oakhill	98	40	75.3	5.95	
Palmetto	95	42	76.2	2.08	
Peryear	......	......	......	1.45	
Pope	96	40	75.0	3.47	
Rogersville	92	44	72.0	3.90	
Rugby	95	38	71.8	5.02	
Savannah	95	45	78.4	3.45	
Sewanee	91	46	73.7	1.30	
Silverlake	85	41	65.8	5.14	
Springfield	97	40	75.8	1.95	
Tazewell	......	......	......	3.68	
Tellico Plains	96	43	76.1	3.26	
Tracy City	88	40	71.4	1.36	
Trenton	97	44	77.1	4.71	
Tullahoma	95	39	73.7	1.07	
Union City	94	44	76.2	2.45	
Wildersville	91	48	76.0	4.78	
Yukon	91	48	75.9	2.20	
Texas.					
Anna	101[d]	54[d]	79.8[d]	7.15	
Anson	......	......	......	12.10	
Arthur	......	......	......	4.93	
Austin *a*	......	62	......	3.60	
Austin *b* *[5]	98	67	80.3	......	
Ballinger	96	62	77.4	7.55	
Beaumont	100	65	82.4	2.00	
Beeville	98	56	80.6	1.37	
Bigspring	......	......	......	2.77	
Blanco	96	62	78.0	3.53	
Boerne *[1]	94	67	79.4	1.99	
Bowie	98	57	78.9	12.07	
Brazoria	94	70	81.9	12.68	
Brenham	96	70	82.0	5.82	
Brighton	98	72	84.1	3.77	
Brownwood	98	64	80.4	8.15	
Burnet *[1]	93	66	78.1	4.51	
Camp Eagle Pass	101	67	83.8	8.20	
Coleman	95	63	77.0	15.82	
Colorado	102[f]	62[f]	80.2[f]	3.25	
Columbia[j]	93	68	81.4	2.16	
Corsicana	95	64	81.6	5.49	
Cuero	96	51	81.1	3.38	
Dallas	98	62	79.6	7.57	
Danevang	93	58	80.8	5.28	
Dublin	94	63	77.8	7.38	
Duval	93	68	80.2	4.82	
Estelle	100	62	80.8	6.51	
Fort Brown	100	63	85.0	0.70	
Fort McIntosh	105	65	86.6	0.05	
Fort Stockton	......	......	......	3.27	
Fredericksburg *[1]	95[d]	66[c]	78.2[d]	2.86	
Gainesville	96	60	79.6	8.56	
Grapevine	103	64	81.0	6.97	
Greenville	102	64	81.2	9.26	
Hale Center	99	52	72.5	9.45	
Hallettsville	93	70	81.9	3.82	
Haskell	......	......	......	11.89	
Hearne	98	70	84.0	7.97	
Henrietta	98	55	77.8	7.02	
Hewitt	......	......	......	4.05	
Hondo	......	......	......	1.77	
Houston	94	70	82.1	5.36	
Huntsville	93	68	81.4	6.84	
Ira	103	54	76.5	4.23	
Jacksonville	95	66	80.3	2.81	
Jasper	96	69	82.0	3.70	
Kaufman	100	68	83.4	......	
Kent	......	......	......	3.17	
Kerrville	93	59	77.6	2.87	
Kopperl	......	......	......	4.90	
Lampasas	97	64	80.2	5.02	
Laureles Ranch	......	......	......	2.11	
Llano *[5]	95	70	81.2	2.40	
Longview	100	66	82.6	5.01	
Luling	96	68	81.0	2.21	
Mann	95	65	79.8	5.68	
Menardville	96	61	77.3	7.06	
Mount Blanco	......	49	......	4.72	
New Braunfels	94	67	81.4	4.55	
Panter	......	......	......	4.39	
Paris *a*	102	63	82.2	1.55	
Point Isabel *[1]	96	80	85.4	0.10	

Stations.	Temperature. (Fahrenheit.) Maximum.	Minimum.	Mean.	Precipitation. Rain and melted snow.	Total depth of snow.
Texas—Cont'd	°	°	°	*Ins.*	*Ins.*
Rhineland	101	55	78.5	6.51	
Rockisland	95	68	81.6	3.70	
Rockport *[1]	92	68	79.3	......	
Runge	98[c]	67[c]	75.0[c]	1.66	
Sabine[k]	95	72	84.4	......	
Saginaw *[1]	99	66	79.5	9.15	
Sanderson	94	70	83.3	4.25	
San Marcos	92	65	80.6	2.58	
Sherman	96	63	80.4	5.90	
Sugarland	96	70	82.0	......	
Sulphur Springs *	99	65	81.6	12.05	
Temple *a*	93	65	80.4	5.60	
Temple *b*	95	63	78.8	5.56	
Trinity	98	70	82.6	8.04	
Turnersville	94	65	79.0	4.82	
Tyler	98	65	82.9	3.05	
Valentine	102	54	74.6	8.15	
Waco	98	70	82.5	4.48	
Waxahachie	101	62	81.6	6.70	
Weatherford	96	64	79.8	9.35	
Wichita Falls	......	......	......	7.11	
Utah.					
Alpine	......	......	......	1.20	
Bluecreek *[1]	95	35	62.0	0.57	
Castledale	83	29	57.4	2.18	
Cisco	89	......	......	0.91	
Corinne	92	30	61.3	1.01	
Deseret	90	28	59.2	1.12	2.0
Farmington	......	......	......	1.90	
Fillmore	96	29	61.9	1.58	
Fishsprings	89[c]	36[c]	64.0[c]	1.37	
Fort Duchesne	92	28	56.6	1.25	
Frisco	81	28	57.6	1.41	2.0
Giles	93	26	60.3	0.29	
Green River	91	32	62.1	1.27	
Grover	81	27	55.4	1.12	T.
Heber	90	22	53.8	1.20	
Henefer	85	17	50.2	2.06	6.0
Hite	97	43	69.9	......	
Holyoake	94	35	65.6	1.88	
Huntsville	......	......	......	1.50	1.0
Kelton *[1]	88	40	60.4	......	
Levan	87	26	57.0	1.70	T.
Loa	79	10	48.2	0.52	
Logan	85	34	59.9	0.94	
Meadowville	......	......	......	1.31	2.0
Millville	......	......	......	1.20	
Moab	91	35	64.0	1.43	
Mount Pleasant	90	25	56.6	1.78	
Ogden *[1]	90	39	62.0	1.32	
Park City	83	23	52.6	2.23	10.3
Parowan	85	27	56.9	0.82	4.5
Pinto	81	21	51.8	1.32	6.5
Provo	91	29	59.2	1.13	
Richfield	80	21	48.6	0.07	
St. George	95	31	63.8	0.29	
Scipio	85	20	54.6	1.17	T.
Snowville	84	26	56.2	0.50	
Soldier Summit	86	18	49.0	0.20	1.0
Thistle	95	25	57.2	1.00	
Tooele	88	32	61.6	1.92	
Tropic	76	16	49.5	3.40	
Vernal	90	30	58.8	1.46	
Wellington	93	24	55.1	1.48	
Woodruff	88	21	49.9	......	
Vermont.					
Bennington	89	34	65.1	1.51	
Burlington	86	41	63.8	3.20	
Chelsea	82	32	58.0	2.12	
Cornwall	86	34	62.2	1.67	
Derby	91	32	58.0	4.52	
Enosburg Falls	91	27	60.2	3.03	
Hartland	86	28	59.1	1.85	
Jacksonville	88	29	59.6	1.76	
Manchester	84	31	61.4	2.19	
Norwich	90	28	59.8	1.48	
St. Johnsbury	87	29	58.0	2.84	
Vernon *[6]	86	36	63.8	1.92	
Wells	84	33	61.4	2.58	
Woodstock	88	28	58.4	1.00	
Virginia.					
Alexandria	98	46	75.6	6.36	
Ashland	99	48	74.0	3.47	
Barboursville	100	47	76.0	4.34	
Bedford	98	47	74.1	5.30	
Bigstone Gap	93	42	71.1	4.30	
Birdsnest *[1]	90	54	73.2	8.05	
Blacksburg	96	40	67.6	4.39	
Bon Air	97	51	74.5	3.64	
Buckingham	104	42	73.9	2.66	
Burkes Garden	85	40	64.1	5.72	
Callaville	94	47	72.6	2.77	
Christiansburg	......	......	......	5.67	
Cliftonforge	100	46	73.5	5.02	
Columbia	......	......	......	1.20	
Dale Enterprise	100	37	71.4	3.22	

TABLE II.—*Climatological record of voluntary and other cooperating observers*—Continued.

Stations.	Temperature. (Fahrenheit.) Maximum.	Minimum.	Mean.	Precipitation. Rain and melted snow.	Total depth of snow.
Virginia—Cont'd.	°	°	°	*Ins.*	*Ins.*
Doswell	101	43	74.7	1.58	
Farmville	100	46	74.8	2.68	
Fontella	104	48	76.6	4.60	
Fredericksburg	100	48	74.9	4.36	
Grahams Forge	93	46	68.6	5.74	
Hampton	93	56	76.4	1.89	
Hot Springs	91	40	67.0	4.91	
Lexington	97	44	72.6	3.79	
Manassas	97	46	74.3	3.28	
Marion	96[e]	43[e]	70.4[e]	4.58	
Meadowdale	90	37	63.9	2.09	
Newport News	96	54	78.1	1.90	
Petersburg	100	49	76.3	3.67	
Radford	.....	.....	.....	5.79	
Rockymount	95	48	72.2	4.35	
Salem	96	48	72.6	5.43	
Speers Ferry	.....	.....	.....	6.38	
Spottsville	101	45	74.8	1.72	
Stanardsville	99	47	72.4	4.40	
Staunton	100	44	73.8	3.64	
Stephens City	97	43	73.6	3.36	
Sunbeam	96	45	74.5	1.72	
Warrenton	95	49	71.9	4.35	
Warsaw	98	49	74.8	1.82	
Westpoint	96	47	74.6	3.92	
Woodstock	96	42	72.5	1.70	
Wytheville	97	41	70.2	5.35	
Washington.					
Anacortes	.....	.....	.....	1.35	
Ashford	.....	.....	.....	2.44	
Bremerton	81	34	58.3	1.05	
Bridgeport	88	33	62.7	0.29	
Brinnon	75	39	56.9	1.59	
Cedonia	79	30	53.8	2.01	
Centerville	92	20	56.3	0.80	
Chehalis	85	32	57.2	1.90	
Cheney	.....	.....	.....	1.70	
Clearwater	76	35	55.6	3.04	
Cle Elum	87	28	55.0	1.94	
Colfax	90	22	58.0	1.42	
Conconully	81	28	55.3	1.28	
Connell	.....	.....	.....	0.13	
Coupeville	78	39	56.3	1.44	
Crescent	88	26	56.9	1.43	
Dayton	85	31	61.4	0.45	
Ellensburg	82	28	55.8	1.40	
Ellensburg (near)	90	32	58.4	1.85	
Grandmound	84	33	58.0	1.21	
Granite Falls	.....	.....	.....	3.05	
Hooper	90	30	60.1	1.30	
Issaquah	.....	.....	.....	1.95	
Lacenter	89	37	58.0	1.91	
Mayfield	.....	.....	.....	2.35	
Mottinger Ranch	91	36	63.4	0.25	
Mount Pleasant	89	39	58.8	2.49	
Moxee Valley	91	28	59.6	1.12	
New Whatcom	75	32	55.6	1.56	
Northport	85	28	54.5	2.48	
Olga	75	39	54.8	1.88	
Olympia	85	32	57.4	1.86	
Pasco	90	30	63.8	0.33	
Pinehill	97	33	61.4	1.16	
Port Townsend	77	40	56.6	1.24	
Pullman	85	26	55.8	1.65	
Republic	89	23	56.0	1.46	
Ritzville	.....	.....	.....	1.59	
Rosalia	85	28	54.8	1.49	
Sedro	78	31	56.5	2.36	
Shoalwater Bay *[10]	84	45	57.6	.....	
Silvana	77	31	54.7	1.49	
Snohomish	77	32	57.5	2.84	
Southbend	87	34	58.4	1.97	
Sprague	.....	.....	.....	0.08	T.
Sunnyside	86	33	60.2	0.72	
Twin	76	34	52.8	1.56	
Union	80	33	56.5	2.49	
Usk[e]	85	28	53.4	.....	
Vancouver	86	36	58.3	1.96	
Vashon	75	39	57.4	1.67	
Waterville	85	28	55.8	0.41	
Wenatchee (near)	84	34	57.3	1.82	
Westsound	80	30	57.2	1.77	
Wilbur	88	25	55.6	0.71	
West Virginia.					
Beckley	86	45	66.6	1.71	
Beverly	96	38	69.2	1.78	
Bluefield	92	43	68.8	3.86	
Buckhannon	95	37	70.2	1.29	
Burlington	100	36	71.1	1.94	
Cairo	.....	.....	.....	0.85	
Central	97	38	71.4	0.55	
Chapel	98	44	74.1	5.13	
Charleston	.....	.....	.....	1.36	
Clay	99	45	74.8	.....	
Creston	.....	.....	.....	0.99	
Dayton	97	35	68.2	0.75	
West Virginia—Cont'd.	°	°	°	*Ins.*	*Ins.*
Eastbank	90	50	72.2	2.62	
Elkhorn	91	44	69.6	5.19	
Fairmont	.....	.....	.....	0.43	
Glenville	99	40	72.4	0.94	
Grafton	95	40	70.6	0.98	
Green Sulphur Springs	95	42	70.5	2.50	
Harpers Ferry	.....	.....	.....	2.48	
Hinton *a*	.....	.....	.....	3.84	
Hinton *b*	94	45	71.4	.....	
Huntington	96	47	72.9	2.11	
Lewisburg	97	41	69.9	4.59	
Marlinton	90	37	67.2	2.57	
Martinsburg	95	44	71.3	3.80	
Morgantown	97	40	72.2	0.48	
New Martinsville	98	44	73.4	0.34	
Nuttallburg	95	40	70.2	2.75	
Oceana	93	44	71.3	3.25	
Oldfields	98	39	72.8	1.87	
Parsons	93	41	67.5	0.50	
Philippi *a*	99	35	70.4	1.08	
Philippi *b*	.....	.....	.....	0.90	
Point Pleasant	98	43	71.4	1.90	
Powellton	.....	.....	.....	1.59	
Princeton	90	38	67.7	5.50	
Romney	100	38	73.6	3.24	
Rowlesburg	.....	.....	.....	1.26	
Southside	96	50	74.5	1.93	
Spencer	99	40	71.7	1.15	
Terra Alta	90	45	71.0	1.00	
Uppertract	96	37	71.2	2.85	
Wellsburg	90	45	68.7	1.24	
Weston *a*	.....	.....	.....	0.88	
Weston *b*	98	39	73.2	.....	
Wheeling *a*	.....	.....	.....	0.87	
Wheeling *b*	97	49	75.8	0.75	
Wiggins	94	50	71.0	.....	
Williamson	95	45	73.6	2.80	
Wisconsin.					
Amherst	90	35	61.0	7.05	
Ashland	.....	.....	.....	4.40	
Bayfield	82	34	59.4	4.80	
Beloit	88	38	65.2	2.70	
Brodhead	92	34	64.0	2.40	
Butternut	84	29	55.6	8.07	
Chilton	90	35	63.5	2.80	
Citypoint	92	36	62.1	6.85	
Delavan	92	37	64.2	2.47	
Dodgeville	92	33	62.7	3.65	
Easton	92	30	61.4	4.16	
Eau Claire	92	35	61.6	8.73	
Florence	84	29	57.4	5.67	T.
Fond du Lac	90	36	62.8	3.06	
Grand River Locks	.....	.....	.....	6.36	
Grantsburg	89	29	59.4	4.60	
Gratiot	90	32	67.6	7.40	
Hartland	89	35	63.3	2.56	
Harvey	91	36	63.8	2.60	
Hayward	86	28	58.8	7.93	
Hillsboro	92	28	61.6	3.78	
Knapp	89	28	58.0	9.46	
Koepenick *[1]	80	50	62.0	8.10	
Lancaster	91	35	62.2	4.77	
Madison	86	42	63.6	2.89	
Manitowoc	89	39	61.0	3.27	
Meadow Valley	94	29	61.2	6.55	
Medford	90	28	59.0	7.95	
Menasha	.....	.....	.....	7.47	
Neillsville	90	32	60.2	8.01	
New London	92	36	61.6	6.48	
Oconto	91	37	62.5	6.32	
Osceola	90	29	59.4	8.14	T.
Oshkosh	86	40	63.3	1.51	
Pepin	92	32	61.6	7.33	
Pine River	92	35	61.2	3.66	
Portage	90	35	62.2	2.90	
Port Washington	90	35	61.2	2.13	
Prairie du Chien *a*	97	38	65.4	3.10	
Prairie du Chien *b*	.....	.....	.....	3.23	
Racine	91	41	65.0	1.82	
Shawano	90	37	62.0	8.02	
Sheboygan	94	40	63.6	3.99	T.
Stevens Point	90	34	60.3	8.81	
Sturgeon Bay Canal *[10]	78	39	60.8	.....	
Two Rivers *[10]	80	42	61.0	.....	
Valley Junction	92	29	60.7	7.18	
Viroqua	90	34	61.4	4.85	
Watertown	90	33	62.6	2.74	
Waukesha	87	40	63.0	2.02	
Waupaca	90	36	61.4	7.02	
Wausau	89	33	59.0	7.88	
Westbend	89	32	62.2	2.63	
Westfield	91	35	62.4	5.35	
Whitehall	90	30	60.0	5.20	
Wyoming.					
Alcova	94	29	59.8	0.94	T.
Basin	94	26	60.3	0.31	T.
Wyoming—Cont'd.	°	°	°	*Ins.*	*Ins.*
Bedford	83	21	50.6	0.44	.....
Bitter Creek	98	28	59.6	0.20	2.0
Buffalo	90	24	56.0	1.24	.....
Burlington	93	25	58.8	0.60	.....
Centennial	77	26	50.6	0.67	5.5
Cody	96	24	56.8	0.00	
Daniel	85	10	43.9	1.60	.....
Evanston	82	18	49.4	1.60	10.0
Fort Laramie	95	29	60.9	2.12	
Fort Washakie	86	26	53.8	1.65	1.5
Fort Yellowstone	82	12	50.0	0.86	
Fourbear	81	16	49.4	1.10	10.0
Hyattville	92	23	57.2	0.55	2.0
Iron Mountain	89	28	55.2	1.33	.....
Kimball Ranch[f]	84	22	54.4	0.27	2.0
Laramie	81	27	53.1	1.11	0.4
Lovell	86	17	55.4	0.32[b]	0.1
Lusk	90	24	55.8	1.21	
Parkman	92	21	55.9	1.35	.....
Pinebluff	92	.....	.....	0.80	.....
Rawlins	83	27	52.8	0.94	
Saratoga	85	25	54.8	0.89	
Sheridan	92	21	56.1	1.08	T.
South Pass City	80	17	48.6	1.27	6.5
Thayne	83	19	50.0	0.75	.....
Thermopolis	92	29	60.2	1.44	
Wheatland	93	34	64.3	1.42	T.
Cuba.					
Aguacate	94	65	79.8	7.75	
Batabano	92	68	80.2	5.97	
Camajuani	92	60	78.3	8.24	
Cardenas	98	70	82.8	4.26	
Cruces	.....	.....	.....	9.99	
Gibara	92	65	79.4	6.61	
Guabairo	.....	.....	.....	8.51	
Guanajay	82	65	79.8	9.59	
Guantanamo	95	64	80.3	16.95	
Holguin	92	64	79.2	7.05	
Limonar	.....	.....	.....	10.80	
Los Canos	95[c]	64[c]	72.8[c]	20.15	
Magdalena	.....	.....	.....	14.47	
Manzanillo	93	72	81.8	12.66	
Matanzas	94	57	79.4	6.85	
Moron Trocha	94	67	80.5	11.76	
Nuevitas	91	72	79.6	5.16	
Numero	91	61	78.6	5.41	
Pinar del Rio	93	69	81.0	6.20	
Sagua la Grande	95	67	80.1	5.22	
San Cayetano	97	68	81.0	6.10	
Santa Clara	97	.....	.....	9.53	
Soledad	91	67	78.5	6.36	
Porto Rico.					
Adjuntas	94	.....	.....	4.61	
Aguadilla	90	74	82.4	5.21	
Arecibo	90	69	78.5	3.59	
Bayamon	96	67	80.4	9.34	
Caguas	89	68	79.0	4.75	
Canovanas	91	73	80.8	5.55	
Cayey	.....	.....	.....	4.19	
Cidra	91	66	77.7	5.90	
Coamo	97	67	80.6	6.85	
Comerio	92[e]	67[e]	78.4[e]	5.54	
Corozal	94	62	79.0	3.70	
Hacienda Coloso	96	67	80.1	4.82	
Hacienda Peria	92	71	80.6	12.07	
Humacao	97	71	83.0	6.04	
La Isolina	93	66	77.4	11.19	
Lajas	93	66	79.8	4.80	
Manati	94	66	80.2	9.28	
Maunabo	90	74	82.2	6.48	
Mayaguez	93	68	81.2	7.44	
Morovis	92	67	78.5	5.82	
Port America	94	69	80.3	10.47	
Puerta de Tierra	94	73	82.9	3.12	
San German	92	69	80.8	3.32	
San Lorenzo	94	66	80.1	5.10	
Utuado	.....	.....	.....	3.37	
Vieques	89	71	80.0	3.60	
Waikato	95	68	79.7	8.98	
Yanco	99	66	81.3	2.75	
Mexico.					
Ciudad P. Diaz	98	70	82.7	6.33	
Leon de Aldamas	83	53	68.0	2.21	
Puebla	77	52	65.1	8.10	
Tampico	92	74	82.0	5.56	
Topolobampo *[1]	95	76	84.1	3.65	
New Brunswick.					
St. John	77	37	57.0	2.50	
Nicaragua.					
Rivas	90	75	81.6	22.58	

TABLE II.—*Climatological record of voluntary and other cooperating observers—Late reports for August, 1900.*

Stations.	Temperature. (Fahrenheit.)			Precipitation.	
	Maximum.	Minimum.	Mean.	Rain and melted snow.	Total depth of snow.
Alaska.	°	°	°	*Ins.*	*Ins.*
Coal Harbor	69	42	54.2	5.74	
Juneau	71	39	54.8	6.57	
Kenai	66	29	51.8	3.92	
Killisnoo	70	36	54.2	2.30	
Orca	.....	.....	.....	11.25	
Skagway	75	38	58.0	T.	
Tyoonok	73	31	52.4	4.94	
Wood Island	70	42	57.6	2.74	
Arizona.					
San Simon *[1]	88	70	75.9	0.00	
California.					
Agnew	100	47	68.9	0.00	
Angiola	109	49	73.8	0.00	
Bakersfield	109	51	77.4	0.00	
Bear Valley	.....	.....	.....	0.00	
Bellevue	.....	.....	.....	1.17	
Blue Lake City	106	43	69.4	0.00	
Branscomb	.....	.....	.....	T.	
Caliente *[1]	96	62	76.2	0.00	
Coronado	83	58	67.5	.....	
Deweyville	110	55	76.4	0.00	
Folsom City *[1]	104	60	78.5	0.00	
Fordyce	.....	.....	.....	T.	
Grass Valley	.....	.....	.....	0.00	
Hanford	108	49	74.1	0.00	
Jolon	.....	.....	.....	0.00	
Kent	.....	.....	.....	0.00	
Kernville	.....	.....	.....	0.00	
Lamesa	.....	.....	.....	0.00	
Lankershim	113	42	73.6	0.00	
Las Fuentes	.....	.....	.....	T.	
Legrand	109	48	73.6	0.00	
Merced	108	51	74.4	0.00	
Mills College	.....	.....	.....	0.00	
Milo	.....	.....	.....	T.	
Pilot Creek	.....	.....	.....	0.00	
Ranch House	.....	.....	.....	0.00	
Raymond	108	42	76.3	0.00	
Reedley	109	50	74.9	0.00	
San Miguel Island	80	52	62.2	0.00	
Visalia	108	50	78.4	0.00	
West Saticoy	.....	.....	.....	0.00	
Colorado.					
Lay	99	31	66.2	0.34	
Florida.	°	°	°	*Ins.*	*Ins.*
Federal Point	97	67	81.6	2.21	
Nocatee	98*	66*	81.8*	6.27	
Illinois.					
Yorkville	98	57	77.0	4.23	
Louisiana.					
Emilie	93	69	80.2	3.15	
Michigan.					
Isle Royal	76	30	54.9	5.71	
Minnesota.					
Brainerd	96	46	73.8	7.73	
Glencoe	93	50	74.7	4.80	
Willmar	98	55	74.8	5.33	
Zumbrota [1]	95*	50	77.0	.....	
Mississippi.					
Batesville	95	63	80.4	1.71	
Corinth	97	65	81.6	0.66	
Hernando	98	65	82.5	2.05	
Holly Springs	97	66	82.2	0.76	
Missouri.					
Sedalia	102[c]	60[c]	79.6[c]	6.10	
Nebraska.					
Whitman	.....	.....	.....	0.00	
Nevada.					
Martins	87	37	60.6	T.	
New Mexico.					
Horse Springs	98	45	70.7	2.60	
North Carolina.					
Morganton	100	61	80.0	1.15	
Oregon.					
McMinnville	87[d]	36[d]	62.6[d]	0.19	
Tillamook	.....	.....	.....	1.40	
South Dakota.					
Rochford	104	34	64.2	3.83	
Rosebud	104	49	71.6	2.32	
Tennessee.					
Lafayette *[5]	98	62	79.4	3.03	
Texas.					
Temple *a*	94	66	81.1	4.60	
Washington.					
Anacortes	.....	.....	.....	1.27	
West Virgina.					
Oldfields	98	52	77.6	1.73	

EXPLANATION OF SIGNS.

* Extremes of temperature from observed readings of dry thermometer.

A numeral following the name of a station indicates the hours of observation from which the mean temperature was obtained, thus:

[1] Mean of 7 a. m. + 2 p. m. + 9 p. m. + 9 p. m. ÷ 4.
[2] Mean of 8 a. m. + 8 p. m. ÷ 2.
[3] Mean of 7 a. m. + 7 p. m. ÷ 2.
[4] Mean of 6 a. m. + 6 p. m. ÷ 2.
[5] Mean of 7 a. m. + 2 p. m. ÷ 2.
[6] Mean of readings at various hours reduced to true daily mean by special tables.
[7] Mean from hourly readings of thermograph.
[9] Mean of sunrise and noon.
[10] Mean of sunrise, noon, sunset, and midnight.

The absence of a numeral indicates that the mean temperature has been obtained from daily readings of the maximum and minimum thermometers.

An italic letter following the name of a station, as "Livingston *a*," "Livingston *b*," indicates that two or more observers, as the case may be, are reporting from the same station. A small roman letter following the name of a station, or in figure columns, indicates the number of days missing from the record; for instance "n" denotes 14 days missing.

No note is made of breaks in the continuity of temperature records when the same do not exceed two days. All known breaks, of whatever duration, in the precipitation record receive appropriate notice.

CORRECTIONS.

July, 1900, in table of late reports for June, 1900, page 310, the values for Cardenas, Cuba, are for July instead of June, 1900; June, 1900, Colorado, Ruby, make total precipitation 0.43 instead of 4.30.

NOTE.—The following changes have been made in names of stations: Colorado, Minneapolis, changed to Blaine; Oklahoma, Osage, changed to Blackburn; Guthrie, changed to Vittum.

TABLE III.—*Mean temperature for each hour of seventy-fifth meridian time, September, 1900.*

Stations.	1 a. m.	2 a. m.	3 a. m.	4 a. m.	5 a. m.	6 a. m.	7 a. m.	8 a. m.	9 a. m.	10 a. m.	11 a. m.	Noon.	1 p. m.	2 p. m.	3 p. m.	4 p. m.	5 p. m.	6 p. m.	7 p. m.	8 p. m.	9 p. m.	10 p. m.	11 p. m.	Midn't.	Mean.
Bismarck, N. Dak	53.1	52.2	51.3	50.8	50.2	49.4	48.7	48.6	49.7	52.8	55.8	58.1	60.0	61.6	62.7	63.7	63.8	63.5	62.5	60.0	57.4	55.4	53.9	52.9	55.8
Boston, Mass	61.4	60.7	60.2	59.8	59.7	59.9	61.4	63.3	65.5	67.0	68.3	68.8	69.8	69.7	69.9	69.5	68.8	67.6	66.2	64.8	63.8	62.9	62.3	61.7	64.7
Buffalo, N. Y	65.1	64.7	64.1	63.3	63.0	62.6	63.0	64.1	66.2	68.0	69.6	70.7	72.0	72.4	72.6	72.8	72.3	71.5	70.1	68.5	67.2	66.3	65.7	65.0	67.5
Cedar City, Utah	55.5	55.0	54.3	53.7	52.7	51.1	50.6	50.3	50.5	53.6	57.2	60.4	63.1	64.7	66.0	67.6	67.8	68.1	67.5	65.5	62.8	59.6	58.4	56.4	58.9
Chicago, Ill	64.1	63.3	62.8	62.3	61.7	61.4	61.1	62.3	63.4	64.9	66.7	67.9	68.7	68.7	68.4	68.6	68.4	68.3	67.6	67.1	66.2	65.7	64.8	64.2	65.4
Cincinnati, Ohio	70.1	69.2	68.3	67.7	66.5	65.8	65.4	66.8	69.6	72.1	75.4	77.5	79.5	80.6	81.5	81.5	81.5	80.5	78.8	77.2	74.9	73.7	72.1	71.0	73.6
Cleveland, Ohio	64.7	64.6	63.8	62.8	62.6	61.9	61.8	63.1	66.1	68.5	69.8	70.3	71.3	71.7	72.0	72.2	72.3	72.3	70.6	69.5	68.1	66.8	65.6	64.9	67.4
Detroit, Mich	63.5	63.1	62.5	61.2	60.7	60.4	60.2	61.9	64.3	66.6	68.6	70.4	72.0	72.7	73.3	74.0	73.8	72.9	70.8	68.8	66.8	65.9	64.9	64.0	66.8
Dodge, Kans	64.6	63.6	62.9	62.4	61.6	61.0	60.9	60.5	63.1	66.3	69.6	72.2	74.5	76.0	77.7	78.7	79.1	78.6	77.1	72.4	69.6	68.0	66.5	65.4	68.8
Eastport, Me	53.8	53.3	52.8	52.4	52.1	52.0	53.1	54.7	56.1	57.6	59.2	60.7	61.6	62.3	61.9	61.2	60.3	59.2	57.2	56.8	56.0	55.5	54.9	54.4	56.6
Galveston, Tex	82.0	81.6	81.3	80.7	80.5	80.3	80.5	81.4	81.0	84.6	85.3	86.5	87.0	87.4	87.6	87.1	87.1	86.6	85.5	84.0	83.5	83.2	82.8	82.2	83.8
Havre, Mont	51.1	50.0	48.4	47.3	46.3	45.6	44.9	44.9	45.7	48.3	51.1	53.1	55.6	57.6	59.5	60.6	61.2	61.3	60.7	59.9	55.4	53.2	51.7	50.9	52.7
Independence, Cal	62.8	61.9	59.9	58.5	57.4	56.4	55.9	54.6	52.5	54.4	58.5	62.6	65.2	68.5	71.1	72.9	74.1	73.9	74.1	73.4	69.8	67.4	65.5	64.2	64.0
Kalispell, Mont	48.6	47.9	46.9	45.9	45.2	44.8	43.7	43.6	43.5	45.4	47.9	51.3	54.4	56.5	57.7	58.9	59.9	60.2	60.2	59.0	56.4	51.3	50.8	49.2	51.3
Kansas City, Mo	68.5	67.8	66.9	66.3	65.2	64.1	64.7	64.1	65.4	67.7	70.3	72.3	73.9	75.1	76.4	77.5	77.8	77.5	76.7	74.2	72.4	71.3	70.0	69.0	70.6
Key West, Fla	79.9	79.5	79.3	78.9	78.9	78.4	79.3	81.1	81.9	82.8	82.9	83.6	83.6	83.8	83.2	82.9	82.7	81.8	80.7	80.5	80.2	80.3	80.1	80.0	81.1
Marquette, Mich	56.4	56.3	56.1	55.9	55.6	55.5	55.3	57.0	57.4	58.7	60.6	61.6	62.3	62.8	62.5	62.4	62.0	61.6	60.2	58.5	57.5	57.1	56.5	56.2	58.6
Memphis, Tenn	74.4	73.7	73.1	72.4	71.8	71.1	70.7	71.8	74.4	77.2	79.7	82.2	84.2	85.2	85.2	85.3	84.7	83.9	81.9	80.3	78.8	77.1	76.1	75.1	77.9
Mt. Tamalpais, Cal	57.7	57.2	57.4	57.2	56.9	56.6	56.1	56.2	56.0	56.0	57.0	58.5	60.1	61.5	62.9	64.4	64.2	63.5	62.1	60.9	59.2	58.5	58.4	58.5	59.0
New Orleans, La	77.7	72.2	76.9	76.6	76.4	76.0	76.6	78.1	80.6	82.0	83.3	85.0	86.4	87.3	87.7	87.4	86.4	84.9	83.4	82.0	80.2	79.6	79.0	78.4	81.2
New York, N. Y	68.4	67.8	67.0	66.6	66.4	66.0	66.4	67.3	69.2	71.4	72.7	74.1	74.9	75.4	75.5	75.0	74.4	72.9	71.7	71.0	70.2	69.6	69.0	68.4	70.5
Philadelphia, Pa	68.3	67.4	66.8	66.3	66.2	65.9	66.8	68.5	70.6	72.6	74.4	76.4	77.5	78.3	79.0	79.2	77.9	76.3	74.4	72.6	71.2	70.3	69.5	68.8	71.9
Pittsburg, Pa	67.4	66.7	65.6	64.9	64.2	63.6	63.6	65.2	68.5	71.7	74.8	76.9	78.5	79.9	80.6	80.6	80.0	78.6	76.2	74.4	71.9	70.6	69.2	67.9	71.7
Portland, Oreg	59.4	58.5	57.2	56.0	54.9	54.2	53.1	53.2	52.1	52.2	53.8	55.6	58.0	60.0	62.5	64.4	66.0	67.0	67.1	66.0	64.5	62.8	61.3	60.1	59.2
St. Louis, Mo	70.1	69.5	68.9	68.1	67.6	66.9	66.6	67.2	68.9	71.2	74.5	77.0	78.8	79.8	80.7	80.9	80.6	79.5	77.9	76.5	74.9	73.7	72.4	71.0	73.5
St. Paul, Minn	59.7	58.8	58.0	57.2	56.5	56.1	55.7	55.4	56.6	58.9	60.7	62.5	64.2	65.4	66.4	67.0	67.5	67.7	66.6	65.0	63.7	62.3	61.1	60.1	61.4
Salt Lake City, Utah	59.3	58.7	58.0	56.5	56.2	55.1	54.0	53.5	53.1	56.7	61.7	65.5	68.3	69.4	70.8	71.8	72.8	72.5	71.2	69.9	66.3	63.9	61.2	60.2	62.8
San Diego, Cal	63.6	63.2	62.4	62.1	61.5	61.2	61.1	60.8	60.9	62.1	64.7	66.6	68.7	69.3	69.9	70.1	70.1	69.7	69.0	68.3	66.9	65.9	65.0	64.3	65.3
San Francisco, Cal	60.0	59.3	58.8	58.5	58.1	57.9	57.6	58.7	57.4	58.5	60.5	62.5	64.8	66.4	68.3	68.3	67.9	66.9	65.3	64.7	63.1	62.0	61.3	60.5	62.0
Santa Fe, N. Mex	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Savannah, Ga	75.0	74.4	73.9	73.4	72.8	72.2	72.9	75.3	79.3	82.1	83.9	84.9	85.4	84.7	84.8	83.8	83.0	81.3	79.4	78.5	77.4	77.0	76.4	75.8	78.7
Washington, D. C	68.3	67.9	67.3	66.2	65.9	65.7	66.4	69.9	72.7	75.5	77.4	79.0	80.6	81.2	81.5	81.2	80.6	78.7	75.7	73.5	72.1	70.8	69.8	68.9	73.2
West Indies.																									
Basseterre, St. Kitts	79.5	79.5	79.4	79.4	79.6	80.7	82.3	82.4	83.9	84.6	85.2	85.1	84.2	83.8	82.5	82.4	81.4	80.6	80.4	81.1	80.4	80.3	79.9	79.8	81.6
Bridgetown, Bar	77.3	77.2	77.0	77.2	77.1	79.5	83.1	83.9	85.2	85.1	86.1	85.7	85.2	84.3	83.6	83.1	81.1	80.0	79.3	79.0	78.6	78.4	78.1	77.5	80.9
Cienfuegos, Cuba	75.2	74.4	73.8	74.5	73.8	73.5	74.6	78.2	81.7	83.5	84.9	86.0	86.9	86.2	85.1	84.4	83.7	80.8	79.5	78.7	77.7	77.1	76.4	75.8	79.4
Havana, Cuba	77.3	76.4	75.8	75.7	75.3	75.1	75.4	77.9	80.7	83.2	84.3	83.9	84.4	84.2	83.9	83.5	83.3	82.0	80.7	80.2	79.6	79.1	78.4	77.9	80.0
Kingston, Jamaica	74.2	73.8	73.4	73.3	73.1	72.9	74.9	78.0	82.4	83.8	85.0	83.9	85.2	84.0	83.0	81.8	80.7	79.5	77.9	77.0	76.0	75.0	74.4	74.2	78.3
Port of Spain, Trin	75.1	74.7	74.2	74.1	74.1	75.6	79.0	81.3	84.0	85.3	85.2	85.8	85.9	84.8	84.7	83.8	81.6	79.8	79.0	78.5	77.5	76.8	76.2	75.5	79.7
P. Principe, Cuba	73.2	72.4	72.3	71.7	71.3	71.3	71.8	76.9	79.4	82.0	84.0	85.9	86.7	86.9	86.5	83.2	82.2	80.4	78.1	76.3	75.6	75.1	74.1	73.8	78.0
Roseau, Dominica	76.9	76.6	76.5	76.6	76.8	77.8	81.1	82.6	84.3	85.5	85.6	86.3	86.5	86.3	85.6	84.2	82.6	80.4	79.2	78.9	78.7	78.4	77.9	77.8	81.0
San Juan, P. R	76.9	76.5	76.3	76.3	76.1	77.1	79.4	81.1	83.6	84.6	85.0	85.4	84.1	83.9	83.0	82.0	81.1	80.4	79.9	79.7	79.0	78.5	78.0	77.4	80.2
Santiago de Cuba	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Santo Domingo, S. D	75.0	74.6	74.3	74.2	73.6	73.4	75.4	78.9	81.5	83.8	85.1	85.6	84.9	84.8	84.3	83.8	83.2	80.7	79.5	78.4	77.5	76.9	76.3	75.6	79.2
Willemstad, Curaçao	80.1	79.8	79.7	79.3	79.2	79.2	81.2	82.6	83.3	84.3	85.2	86.1	86.5	87.2	86.4	85.5	83.8	82.2	81.7	81.3	81.1	81.0	80.8	80.5	82.4

TABLE IV.—*Mean pressure for each hour of seventy-fifth meridian time, September, 1900.*

Stations.	1 a. m.	2 a. m.	3 a. m.	4 a. m.	5 a. m.	6 a. m.	7 a. m.	8 a. m.	9 a. m.	10 a. m.	11 a. m.	Noon.	1 p. m.	2 p. m.	3 p. m.	4 p. m.	5 p. m.	6 p. m.	7 p. m.	8 p. m.	9 p. m.	10 p. m.	11 p. m.	Midn't.	Mean.
Bismarck, N. Dak	28.225	.225	.224	.222	.226	.228	.231	.229	.233	.233	.235	.231	.220	.214	.201	.195	.195	.120	.204	.205	.246	.227	.233	.237	.220
Boston, Mass	29.926	.922	.921	.921	.923	.932	.938	.942	.943	.938	.926	.916	.905	.897	.892	.889	.892	.898	.907	.918	.924	.927	.928	.927	.919
Buffalo, N. Y	29.239	.236	.234	.234	.239	.247	.262	.265	.271	.275	.272	.267	.257	.250	.238	.232	.231	.235	.239	.242	.248	.248	.245	.243	.248
Cedar City, Utah	24.263	.262	.263	.261	.262	.261	.263	.267	.277	.287	.292	.296	.291	.279	.269	.253	.242	.235	.230	.233	.248	.249	.258	.260	.262
Chicago, Ill	29.185	.187	.188	.187	188	.192	.204	.215	.218	.217	.216	.209	.197	.186	.172	.163	.159	.156	.154	.156	.164	.176	.179	.184	.185
Cincinnati, Ohio	29.416	.416	.414	.418	.428	.439	.452	.455	.463	.465	.455	.443	.426	.412	.397	.391	.387	.389	.393	.397	.407	.411	.415	.417	.421
Cleveland, Ohio	29.253	.253	.253	.256	.265	.275	.286	.288	.293	.294	.291	.283	.272	.262	.253	.251	.249	.248	.251	.255	.258	.255	.255	.253	.265
Detroit, Mich	29.270	.272	.274	.276	.285	.293	.305	.309	.314	.318	.316	.304	.293	.280	.266	.260	.256	.257	.256	.261	.270	.267	.269	.269	.281
Dodge, Kans	27.410	.413	.413	.414	.414	.413	.420	.423	.434	.440	.442	.433	.417	.401	.380	.365	.354	.349	.352	.366	.377	.389	.399	.403	.401
Eastport, Me	29.944	.942	.942	.945	.949	.956	.961	.965	.965	.962	.950	.941	.927	.918	.909	.907	.912	.922	.934	.944	.946	.947	.946	.945	.941
Galveston, Tex	29.886	.886	.882	.880	.882	.889	.899	.905	.915	.924	.927	.921	.908	.891	.871	854	.846	.839	.836	.836	.849	.868	.877	.880	.881
Havre, Mont	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Independence, Cal	25.925	.930	.934	.938	.939	.939	.943	.949	.959	.966	.978	.978	.975	.963	.945	.929	.910	.901	.892	.886	.887	.894	.910	.919	.933
Kalispell, Mont	26.928	.930	.931	.932	.931	.930	.933	.936	.946	.954	.956	.954	.948	.938	.929	.915	.907	.901	.895	.895	.900	.913	.925	.929	.927
Kansas City, Mo	29.022	.021	.022	.021	.023	.029	.041	.048	.061	.066	.067	.062	.057	.041	.020	.006	.998	.992	.991	.993	.003	.016	.022	.022	.027
Key West, Fla	29.930	.922	.916	.911	.911	.916	.926	.939	.950	.955	.958	.950	.936	.919	.906	.892	.889	.887	.895	.912	.923	.930	.933	.930	.922
Marquette, Mich	29.204	.207	.206	.208	.212	.214	.224	.228	.228	.231	.225	.223	.215	.207	.197	.196	.192	.192	.198	.201	.206	.209	.209	.211	.210
Memphis, Tenn	29.634	.631	.631	.631	.635	.647	.661	.671	.680	.685	.686	.678	.662	.635	.619	.608	.602	.600	.601	.611	.627	.633	.636	.635	.639
Mt. Tamalpais, Cal	27.514	.512	.509	.507	.503	.497	.495	.499	.509	.520	.528	.538	.544	.546	.544	.535	.523	.516	.507	.501	.494	.501	.509	.514	.515
New Orleans, La	29.939	.934	.932	.930	.936	.945	.957	.965	.971	.974	.974	.969	.952	.935	.917	.907	.904	.904	.906	.916	.930	.940	.942	.939	.938
New York, N. Y	29.745	.740	.737	.738	.743	.749	.757	.763	.767	.767	.759	.750	.737	.726	.718	.714	.715	.720	.728	.736	.743	.747	.749	.746	.741
Philadelphia, Pa	29.960	.955	.951	.954	.960	.971	.980	.986	.989	.990	.982	.973	.957	.945	.934	.929	.931	.934	.942	.953	.956	.962	.964	.961	.959
Pittsburg, Pa	29.187	.184	.182	.184	.189	.198	.209	.216	.220	.218	.213	.203	.190	.177	.164	.154	.154	.156	.166	.175	.185	.187	.186	.185	.188
Portland, Oreg	29.870	.876	.881	.883	.882	.883	.882	.887	.890	.897	.900	.903	.900	.894	.885	.875	.864	.854	.849	.846	.844	.845	.852	.858	.875
St. Louis, Mo	29.452	.451	.450	.452	.456	.466	.483	.489	.493	.496	.492	.482	.467	.453	.437	.429	.421	.419	.421	.423	.438	.445	.449	.456	.455
St. Paul, Minn	29.100	.104	.103	.102	.101	.104	.109	.114	.115	.117	.120	.118	.108	.097	.089	.080	.073	.071	.070	.075	.082	.091	.095	.099	.097
Salt Lake City, Utah	25.585	.585	.589	.591	.594	.595	.599	.606	.616	.623	.625	.628	.622	.611	.596	.582	.566	.558	.554	.553	.554	.561	.574	.577	.589
San Diego, Cal	29.813	.812	.813	.811	.808	.807	.805	.812	.819	.827	.833	.836	.839	.832	.822	.815	.804	.793	.787	.787	.788	.793	.805	.813	.811
San Francisco, Cal	29.796	.797	.799	.799	.797	.796	.796	.800	.809	.820	.824	.831	.833	.826	.818	.808	.794	.784	.777	.773	.777	.781	.789	.796	.801
Santa Fe, N. Mex	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Savannah, Ga	30.000	.992	.987	.986	.993	.003	.018	.028	.036	.039	.032	.021	.007	.991	.979	.972	.971	.974	.979	.988	.998	.001	.004	.001	.000
Washington, D. C	29.953	.952	.952	.955	.960	.970	.982	.990	.997	.002	.997	.986	.969	.952	.940	.931	.929	.930	.931	.940	.948	.950	.953	.953	.959
West Indies.																									
Basseterre, St. Kitts	29.913	.901	.898	.897	.905	.919	.934	.942	.954	.953	.943	.923	.907	.890	.886	.888	.896	.906	.920	.936	.945	.942	.936	.926	.919
Bridgetown, Bar	29.887	.876	.875	.880	.887	.899	.913	.925	.928	.927	.912	.891	.873	.862	.860	.860	.866	.877	.889	.908	.916	.915	.911	.900	.893
Cienfuegos, Cuba	29.860	.850	.840	.838	.846	.857	.867	.878	.886	.889	.885	.870	.850	.833	.817	.813	.815	.830	.843	.860	.871	.877	.875	.869	.855
Havana, Cuba	29.876	.865	.856	.854	.858	.867	.878	.893	.900	.908	.907	.895	.879	.863	.846	.838	.840	.844	.852	.862	.878	.886	.889	.882	872
Kingston, Jamaica	29.627	.611	.598	.592	.596	.603	.615	.622	.634	.636	.632	.616	.595	.577	.563	.559	.562	.571	.587	.598	.622	.636	.637	.632	.605
Port of Spain, Trin	29.861	.852	.853	.859	.870	.883	.902	.909	.911	.901	.880	.855	.834	.822	.815	.817	.829	.841	.858	.874	.890	.893	.886	.873	.865
P. Principe, Cuba	29.592	.583	.573	.569	.575	.582	.593	.603	.611	.615	.611	.600	.581	.562	.547	.549	.554	.564	.574	.586	.604	.612	.609	.602	.585
Roseau, Dominica	29.899	.887	.883	.885	.894	.904	.918	.931	.935	.933	.920	.900	.887	.874	.868	.867	.872	.884	.897	.917	.921	.922	.918	.909	.901
San Juan, P. R	29.865	.852	.847	.852.	.860	.870	.883	.894	.898	.894	.884	.862	.844	.834	.826	.831	.838	.855	.866	.881	.889	.887	.884	.875	.866
Santiago de Cuba	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Santo Domingo, S. D	29.894	.881	.871	.869	878	.887	.903	.918	.925	.923	.914	.895	.874	.857	.846	.841	.850	.864	.875	.894	.908	.917	.913	.905	.888
Willemstad, Curaçao	29.792	.778	.771	.778	.790	.802	.820	.831	.837	.831	.814	.789	.754	.732	.711	.704	.709	.727	.754	.780	.805	.816	.816	.809	.781

TABLE V.—*Average wind movement for each hour of seventy-fifth meridian time, September, 1900.*

Stations	1 a. m.	2 a. m.	3 a. m.	4 a. m.	5 a. m.	6 a. m.	7 a. m.	8 a. m.	9 a. m.	10 a. m.	11 a. m.	Noon.	1 p. m.	2 p. m.	3 p. m.	4 p. m.	5 p. m.	6 p. m.	7 p. m.	8 p. m.	9 p. m.	10 p. m.	11 p. m.	Midnight.	Mean.
Abilene, Tex.	8.6	8.5	8.1	8.2	8.2	7.0	6.1	6.3	7.0	9.0	9.9	10.7	11.4	11.1	10.7	10.8	11.5	11.1	10.6	8.8	7.3	7.7	7.7	8.4	8.9
Albany, N. Y.	5.6	5.5	5.1	5.0	4.9	5.8	6.0	6.5	7.9	8.5	9.0	9.0	9.4	9.2	9.5	9.2	8.7	7.8	6.8	6.7	6.3	5.8	6.3	5.9	7.1
Alpena, Mich.	8.4	7.6	7.7	8.3	8.3	7.8	7.2	8.5	9.2	10.0	10.7	11.5	12.5	12.7	13.0	12.6	11.9	10.8	9.4	8.1	8.7	8.9	9.3	8.5	9.6
Amarillo, Tex.	12.5	13.7	12.9	12.7	12.4	13.0	13.4	14.1	12.5	14.4	16.5	16.1	16.4	15.7	15.9	15.4	16.6	17.4	16.3	14.2	12.1	11.7	12.0	12.9	14.2
Atlanta, Ga.	8.9	9.2	8.5	8.2	8.1	7.9	7.6	7.3	7.9	8.1	8.9	9.6	9.8	9.4	9.6	9.7	10.2	8.8	7.9	7.7	7.6	8.7	8.7	8.9	8.6
Atlantic City, N. J.	8.2	7.8	8.1	8.2	8.5	8.1	8.6	9.6	9.7	0.8	10.1	10.0	10.5	11.3	11.4	11.0	10.6	8.6	8.3	8.8	9.0	8.4	8.8	8.4	9.2
Augusta, Ga.	3.2	3.2	3.4	3.2	2.9	3.0	2.9	3.3	4.6	5.7	6.7	6.9	7.5	7.8	7.3	6.8	6.5	5.6	4.3	3.9	3.6	3.7	3.4	2.8	4.7
Baker City, Oreg.	3.2	2.9	2.9	3.8	4.1	4.8	5.0	5.8	5.6	5.2	4.7	4.1	4.7	5.9	6.1	6.7	7.3	7.4	7.9	7.6	5.4	4.5	4.0	3.1	5.1
Baltimore, Md.	3.5	3.5	3.4	3.2	3.6	3.6	4.1	4.2	5.1	5.6	5.8	5.7	5.7	6.0	5.8	6.0	5.4	4.7	3.6	3.3	3.4	3.5	3.7	3.5	4.4
Bismarck, N. Dak.	10.4	8.8	8.3	8.5	8.9	8.2	8.2	8.7	10.2	11.4	12.7	13.2	14.1	14.6	14.2	14.4	14.6	14.5	12.7	11.2	10.3	10.1	11.0	10.8	11.2
Block Island, R. I.	13.5	13.6	13.3	13.9	14.2	14.0	13.7	14.1	13.8	14.2	14.5	13.3	14.0	14.4	14.8	14.6	13.7	14.0	13.4	13.7	13.3	13.3	13.0	13.2	13.8
Boise, Idaho	3.7	3.3	3.1	2.9	2.9	3.0	3.1	3.2	2.7	2.7	3.1	4.1	4.9	5.4	5.4	5.6	5.5	5.5	5.6	4.8	4.0	3.2	3.4	3.7	3.9
Boston, Mass	7.8	7.8	7.9	7.7	8.5	8.6	8.8	9.0	9.4	10.3	11.2	11.7	12.9	12.8	11.9	11.4	10.7	9.8	9.2	8.7	8.8	8.2	7.9	8.0	9.5
Buffalo, N. Y.	12.1	12.0	12.2	13.1	13.1	11.8	12.1	12.6	11.7	12.1	13.6	13.7	14.7	15.2	14.5	13.3	13.1	13.0	12.0	12.2	12.0	12.5	12.5	12.5	12.8
Cairo, Ill.	5.1	5.2	4.8	5.0	4.9	4.7	4.8	5.2	6.9	6.9	7.2	7.2	7.7	7.7	8.2	7.8	7.3	6.7	5.6	5.1	5.0	5.1	5.2	5.1	6.0
Cape Henry, Va.	10.4	10.0	9.8	9.2	9.4	9.0	9.2	9.2	10.1	9.7	9.6	10.4	11.0	12.0	12.5	12.4	12.0	10.5	10.1	10.5	10.5	10.3	10.6	10.1	10.4
Carson City, Nev.	6.5	6.0	6.0	4.7	4.3	4.3	3.9	3.7	3.7	3.2	3.6	4.5	6.1	7.6	7.8	8.9	9.0	9.8	9.9	10.3	9.6	8.6	8.5	7.9	6.6
Cedar City, Utah	6.3	6.2	6.4	5.6	5.5	5.0	4.8	5.4	5.6	4.8	3.8	5.7	7.3	8.6	8.5	8.5	9.3	9.1	8.2	7.9	6.2	5.5	5.9	6.6	6.5
Charleston, S. C.	8.8	8.4	8.6	8.2	8.3	8.3	8.5	9.0	10.7	11.9	11.9	12.3	13.2	13.9	14.5	14.8	14.2	13.2	11.3	9.8	9.5	9.3	8.9	9.0	10.7
Charlotte, N. C.	4.5	4.8	4.6	4.1	3.9	3.9	3.8	4.2	5.2	5.9	6.1	6.2	5.7	6.1	6.1	6.2	5.6	4.9	4.0	4.2	4.4	4.3	4.8	4.6	4.9
Chattanooga, Tenn.	3.5	3.4	3.0	3.0	3.3	3.3	3.3	3.6	4.4	5.6	6.7	7.7	8.3	8.2	8.6	7.9	8.4	7.2	6.5	4.9	3.6	3.0	2.6	2.7	5.1
Cheyenne, Wyo.	8.5	8.3	7.5	8.3	7.7	7.1	7.4	7.7	7.9	8.8	10.0	10.8	12.2	13.3	13.2	12.8	13.3	13.6	13.1	12.2	10.2	8.5	9.0	8.5	10.0
Chicago, Ill.	14.8	15.2	14.9	15.5	15.9	15.0	14.4	14.5	14.8	15.7	15.2	15.8	16.8	18.0	17.8	18.7	18.2	17.2	16.0	16.0	16.3	16.1	16.6	14.7	16.0
Cincinnati, Ohio	3.9	4.4	4.4	4.3	4.4	3.9	4.4	4.8	5.3	6.3	6.6	7.2	8.3	8.1	8.5	8.4	7.9	7.3	6.2	5.6	5.4	4.6	4.0	3.8	5.7
Cleveland, Ohio	14.6	14.2	13.6	13.3	12.8	13.9	13.5	13.2	12.7	13.5	13.7	14.7	15.1	15.7	15.9	15.6	14.6	13.4	12.3	12.0	12.4	13.4	14.1	14.4	13.9
Columbia, Mo.	6.9	7.0	6.8	6.7	6.9	6.6	6.0	6.7	7.5	8.0	8.4	8.5	8.6	8.6	8.5	8.7	7.9	7.3	6.1	6.6	6.4	7.3	7.1	6.9	7.3
Columbus, Ohio	5.1	4.9	5.1	5.1	5.8	5.4	5.1	5.3	6.2	6.6	7.5	7.7	8.7	9.0	9.5	8.9	8.9	8.4	6.8	6.6	6.6	6.6	6.2	5.2	6.7
Concordia, Kans.	7.5	7.4	7.4	7.1	6.5	6.6	6.0	6.5	7.3	9.5	10.5	10.4	10.4	10.7	10.8	11.1	10.6	10.0	9.1	6.8	6.7	7.1	7.4	7.3	8.4
Corpus Christi, Tex.	13.4	12.6	10.9	10.2	9.1	8.6	8.1	7.8	8.6	10.4	11.7	12.4	14.5	15.7	16.6	16.8	17.0	16.7	16.7	15.9	15.9	16.5	15.5	14.3	13.2
Davenport, Iowa	6.1	5.9	5.7	6.0	5.3	5.5	5.6	5.9	6.8	7.4	8.4	8.9	9.3	9.3	9.6	10.1	9.5	8.1	7.1	5.7	5.1	5.6	5.5	6.0	7.0
Denver, Colo.	6.8	6.7	7.2	7.5	7.8	6.7	7.2	5.9	5.3	5.1	5.3	5.8	7.1	8.2	9.6	9.8	11.1	10.9	11.1	9.2	8.5	8.2	8.8	7.5	7.8
Des Moines, Iowa	6.4	5.9	6.0	6.0	6.0	6.1	6.3	6.8	7.5	7.5	8.5	9.3	10.3	10.9	11.1	11.0	10.6	9.7	8.1	6.7	6.1	6.1	6.2	6.7	7.7
Detroit, Mich.	8.0	8.1	8.2	8.3	8.5	8.2	8.0	8.3	8.8	9.4	9.9	10.2	11.2	11.7	11.3	11.1	10.4	9.3	8.2	8.2	8.3	8.3	8.2	7.9	9.1
Dodge, Kans.	10.7	10.7	10.9	9.7	9.7	9.6	8.7	8.6	9.3	11.7	13.4	13.5	13.8	14.0	14.0	14.6	14.3	13.1	12.1	10.5	9.7	9.4	9.8	9.6	11.3
Dubuque, Iowa	5.9	5.7	6.1	6.0	6.0	5.8	5.8	5.9	7.2	8.2	8.7	9.3	9.5	9.2	9.9	9.5	10.2	9.3	7.9	7.1	6.3	5.6	5.7	5.9	7.4
Duluth, Minn.	9.0	9.3	8.8	8.9	9.4	9.3	9.9	9.3	8.6	8.9	9.3	9.1	10.4	10.6	11.7	11.1	10.9	10.0	8.9	8.7	9.0	9.4	9.9	9.8	9.6
Eastport, Me.	7.8	7.2	6.6	7.0	7.2	7.3	7.4	8.4	9.3	10.0	10.6	10.6	10.8	10.7	11.5	11.2	9.9	8.9	8.6	8.1	7.7	8.0	8.3	8.0	8.8
Elkins, W. Va.	1.3	1.4	1.3	1.9	1.7	1.7	1.7	1.9	2.4	3.1	3.9	5.4	5.9	6.1	5.9	6.1	5.4	4.4	2.3	1.6	1.3	1.2	1.3	1.2	2.9
El Paso, Tex.	8.7	8.6	8.5	8.0	8.3	8.4	8.1	7.8	7.1	6.8	7.5	7.9	8.7	8.9	9.1	10.1	10.6	10.0	9.6	9.9	9.7	10.2	10.4	8.9	8.8
Erie, Pa.	10.2	10.3	10.2	10.0	9.8	10.0	9.7	10.3	10.6	10.7	10.9	10.9	11.5	11.0	10.5	10.0	9.4	8.3	7.6	8.1	9.1	9.5	9.1	10.1	9.9
Escanaba, Mich.	7.5	7.3	6.9	7.0	7.0	7.3	7.1	7.9	9.4	9.6	9.9	10.7	11.0	10.8	10.3	10.1	10.4	10.1	10.6	11.1	10.2	10.1	9.1	8.1	9.2
Eureka, Cal.	5.5	5.0	4.4	4.3	4.0	3.7	3.4	3.4	3.3	3.2	3.0	3.3	4.8	6.8	9.5	10.2	11.5	11.6	11.5	10.5	9.3	7.3	6.0	6.0	6.3
Evansville, Ind.	4.3	4.1	4.3	4.8	4.7	4.3	4.4	5.0	5.4	5.8	6.4	6.7	7.0	7.3	7.5	7.1	6.9	6.0	5.6	4.4	4.9	4.7	4.6	4.3	5.4
Fort Smith, Ark.	6.8	6.4	6.5	6.8	6.4	6.4	6.2	6.4	6.4	7.3	7.6	7.7	8.6	9.6	9.2	9.3	9.3	9.0	8.8	8.0	7.5	7.3	6.3	6.3	7.5
Fort Worth, Tex.	10.1	10.2	9.6	9.8	10.0	8.9	8.9	8.4	9.4	10.8	12.1	12.4	13.0	12.9	12.9	13.1	13.0	12.7	12.1	10.4	10.3	10.6	10.6	10.5	10.9
Fresno, Cal.	4.2	4.1	3.8	3.7	3.4	3.2	3.2	3.1	2.8	2.8	3.3	3.6	3.7	3.7	3.8	4.2	4.2	3.9	3.9	3.9	3.6	3.5	4.1	4.1	3.7
Galveston, Tex.	8.2	8.7	8.7	8.3	8.7	8.5	8.4	8.5	9.7	10.0	10.1	10.4	10.9	11.0	10.7	10.5	10.2	10.3	7.8	7.7	8.0	8.1	8.2	8.1	9.2
Grand Haven, Mich.	8.7	9.0	9.0	8.8	9.0	8.5	8.2	8.6	9.4	10.1	10.4	10.1	10.3	11.0	11.1	10.6	9.9	9.0	8.4	8.2	8.0	8.7	9.2	8.6	9.3
Grand Junction, Colo.	4.3	4.4	3.9	4.3	4.3	4.8	4.9	4.5	5.0	5.4	6.6	7.6	7.3	6.6	6.8	7.7	7.6	7.7	6.8	5.6	4.1	3.6	3.6	3.8	5.5
Green Bay, Wis.	7.0	6.5	6.3	6.8	6.8	6.9	6.5	7.2	8.5	9.6	9.8	9.9	9.9	9.6	10.0	9.7	9.2	9.5	8.0	7.2	7.1	7.3	7.4	7.2	8.1
Harrisburg, Pa.	4.0	4.0	4.4	4.2	4.1	4.4	3.9	4.6	6.1	6.3	6.9	6.9	7.7	7.2	7.0	7.1	6.2	5.3	4.9	5.4	4.6	4.2	4.1	4.3	5.3
Hatteras, N. C.	9.0	9.3	9.3	9.4	9.4	9.0	8.9	9.3	10.2	10.6	11.0	10.6	10.8	11.3	11.4	11.3	11.2	10.6	10.4	10.5	10.4	9.9	9.6	9.6	10.1
Havre, Mont.	6.3	6.4	7.9	7.8	7.1	7.0	7.8	8.5	8.9	9.6	12.3	13.8	13.8	13.2	13.2	13.2	12.5	11.5	10.1	9.1	7.9	7.0	6.7	6.6	9.5
Helena, Mont.	8.4	8.0	7.9	8.0	7.5	7.6	7.6	6.7	6.3	5.7	5.7	6.8	7.3	8.9	9.5	9.5	9.8	9.1	9.4	8.2	8.0	8.9	9.5	8.9	8.0
Huron, S. Dak.	10.4	10.9	10.7	11.0	11.0	11.2	10.7	11.7	12.4	14.7	16.0	16.9	16.8	18.1	18.2	18.3	17.4	15.7	14.0	11.9	10.8	11.3	11.3	10.9	13.4
Independence, Cal.	8.5	8.0	8.3	8.0	7.2	6.8	6.1	6.6	6.2	5.9	6.6	8.7	9.5	9.7	10.1	10.1	10.8	11.7	10.3	10.7	9.5	8.4	8.7	8.8	8.6
Indianapolis, Ind.	7.5	7.1	6.8	6.7	6.7	6.6	6.7	6.3	7.6	9.2	10.3	10.5	10.1	10.4	10.6	11.0	11.1	9.8	8.7	8.1	8.3	8.9	8.4	7.9	8.6
Jacksonville, Fla.	5.1	5.4	5.0	5.0	4.9	5.1	5.1	5.6	6.5	7.7	8.8	9.0	9.4	9.4	10.6	9.7	9.9	8.7	6.9	5.5	5.2	5.6	5.5	5.1	6.9
Jupiter, Fla.	11.7	11.7	11.3	10.7	10.6	10.5	10.0	10.6	11.7	12.9	12.9	13.3	14.0	14.6	14.1	13.8	13.6	12.4	11.7	11.8	11.9	11.9	12.0	11.7	12.1
Kalispell, Mont.	5.5	5.8	5.8	5.7	5.2	[illegible]	5.6	5.7	6.0	5.4	5.0	4.6	4.7	5.6	6.3	7.6	8.4	8.8	8.5	7.2	5.4	5.2	6.0	5.6	6.0
Kansas City, Mo.	8.1	8.2	8.2	7.6	7.4	7.5	7.3	7.0	7.7	8.1	8.9	8.8	8.9	9.3	9.3	9.5	9.9	9.2	8.1	7.1	7.0	7.9	8.3	7.9	8.2
Keokuk, Iowa	6.4	6.3	6.0	6.2	6.1	6.3	6.3	6.2	7.0	7.7	8.2	8.7	8.8	9.8	9.5	9.6	8.8	8.2	7.2	6.2	5.8	5.6	6.2	6.1	7.2
Key West, Fla.	9.1	9.6	9.5	9.6	9.3	8.9	8.9	9.2	9.9	10.5	10.4	10.9	11.4	11.0	10.9	10.1	9.9	9.5	8.9	8.7	9.0	8.8	8.8	8.4	9.6
Kittyhawk, N. C.	10.2	9.8	8.8	8.8	8.6	8.5	8.5	9.3	10.3	10.4	10.4	10.0	10.8	11.4	11.7	12.1	12.8	12.6	11.7	11.8	11.7	11.7	11.5	10.9	10.6
Knoxville, Tenn.	4.1	4.1	3.8	3.2	3.4	3.7	3.5	3.6	4.4	4.7	5.1	5.6	6.2	6.3	6.3	7.0	6.6	6.5	6.2	5.4	4.6	4.0	4.4	4.3	4.9
La Crosse, Wis.	5.7	6.1	6.2	6.3	6.3	6.3	6.3	6.1	6.7	7.2	7.7	8.5	8.6	9.0	8.7	8.6	8.1	7.3	6.3	6.3	5.6	5.9	5.6	5.4	6.9
Lander, Wyo.	4.4	3.5	3.2	2.9	2.8	2.9	2.4	2.4	2.2	2.4	3.2	4.0	4.9	4.5	5.3	5.9	6.5	6.2	6.4	6.0	6.0	5.9	4.8	4.6	4.3
Lexington, Ky.	6.8	6.5	6.7	6.5	6.3	6.2	6.0	5.8	5.8	6.6	6.9	6.9	7.4	7.7	7.9	8.2	7.8	7.3	6.2	6.2	6.6	7.2	6.9	7.3	6.8
Little Rock, Ark.	3.7	4.1	4.0	3.8	4.2	4.5	4.2	4.4	5.3	5.8	6.4	6.6	7.2	7.1	7.9	7.6	7.0	6.7	5.6	5.2	4.1	4.0	3.8	3.6	5.3
Los Angeles, Cal.	2.4	2.3	2.2	2.3	2.5	2.7	2.6	2.9	[illegible]	3.1	3.3	3.8	4.3	5.0	6.2	7.7	9.3	9.7	9.6	8.2	7.0	5.0	3.4	2.4	4.6
Louisville, Ky.	5.0	5.1	5.0	5.0	5.0	4.9	4.8	5.1	6.0	6.5	6.9	7.9	8.1	8.2	8.4	8.2	8.1	7.7	6.6	6.2	5.8	5.8	5.4	5.0	6.3
Lynchburg, Va.	1.3	1.0	1.1	0.9	1.2	1.0	1.2	2.0	3.0	4.0	4.6	4.7	4.6	5.4	5.3	4.9	5.0	4.6	3.6	2.5	2.4	1.8	1.2	1.2	2.9
Macon, Ga.	3.4	4.2	3.7	4.0	3.8	3.7	3.8	4.5	5.4	6.8	7.8	7.8	8.1	7.9	8.3	8.5	7.6	6.7	4.8	4.0	3.6	3.7	3.9	3.8	5.4
Marquette, Mich.	9.9	10.3	10.9	10.7	10.5	10.0	9.9	10.6	10.8	11.6	12.6	12.7	13.1	13.6	13.6	12.3	11.1	10.4	8.8	8.7	8.7	9.2	9.5	9.4	10.8
Memphis, Tenn.	7.3	7.8	7.7	7.3	7.1	6.8	6.9	7.4	8.0	8.7	8.2	8.0	9.0	9.5	10.1	10.2	10.0	9.5	8.6	7.5	7.5	7.8	7.2	7.4	8.1
Milwaukee, Wis.	9.2	9.1	9.3	9.1	9.1	9.1	8.9	9.6	10.4	11.0	11.9	12.5	12.5	13.1	13.6	13.7	13.5	11.5	10.4	10.0	9.3	9.4	9.5	9.1	10.6
Mobile, Ala.	5.7	5.2	5.4	5.6	5.5	5.7	5.7	6.1	6.7	7.2	8.0	8.5	8.9	9.1	9.8	10.6	10.8	10.1	8.4	7.9	7.1	6.6	6.5	6.2	7.4
Montgomery, Ala.	5.2	5.2	4.8	4.2	4.0	4.5	4.8	4.8	6.1	7.1	7.6	8.2	8.8	8.4	8.5	7.6	7.5	6.8	5.2	5.0	5.2	4.7	5.0	4.8	6.0
Moorhead, Minn.	9.7	8.7	8.3	8.8	8.8	9.7	9.7	10.1	10.7	11.7	12.8	13.2	14.2	14.5	14.8	15.4	15.5	13.6	12.0	10.1	9.7	9.3	10.0	9.7	11.3
Mount Tamalpais, Cal.	22.5	22.4	21.3	20.5	19.9	19.2	20.5	20.6	20.0	18.5	16.2	13.9	12.1	11.4	11.7	12.0	12.7	14.7	17.1	19.2	20.9	22.4	21.6	21.6	18.0
Nantucket, Mass.	8.0	7.8	8.3	8.7	9.3	9.1	8.2	9.5	10.5	11.6	12.2	12.3	12.0	12.3	11.9	11.6	10.5	9.2	7.9	8.0	8.1	8.2	8.4	8.6	9.7
Nashville, Tenn.	2.5	2.5	2.6	2.8	2.9	2.9	2.9	3.5	4.6	5.6	6.3	7.0	6.9	7.0	7.5	7.7	6.7	7.0	5.3	4.4	3.9	3.2	3.0	2.6	4.6
Neah Bay, Wash.	5.0	4.5	4.3	4.2	3.9	3.6	3.9	3.8	3.8	3.4	4.0	4.3	5.6	5.4	6.2	6.7	6.9	6.9	7.7	7.1	6.4	5.6	4.9	5.1	5.1
New Haven, Conn.	6.1	5.5	6.0	5.9	5.5	6.0	6.0	7.8	8.9	9.3	9.9	10.7	11.4	12.2	12.5	11.5	10.6	8.4	7.8	7.3	7.0	5.9	6.2	5.8	8.1
New Orleans, La.	7.6	7.6	7.1	7.5	7.7	7.9	7.5	7.8	8.9	10.9	11.5	11.2	11.9	10.9	11.4	10.9	10.5	10.4	9.6	8.4	7.5	7.4	7.2	7.3	9.0

TABLE V.—*Average wind movement, etc.*—Continued.

Stations.	1 a. m.	2 a. m.	3 a. m.	4 a. m.	5 a. m.	6 a. m.	7 a. m.	8 a. m.	9 a. m.	10 a. m.	11 a. m.	Noon.	1 p. m.	2 p. m.	3 p. m.	4 p. m.	5 p. m.	6 p. m.	7 p. m.	8 p. m.	9 p. m.	10 p. m.	11 p. m.	Midnight.	Mean.
New York, N. Y	10.6	10.4	9.2	9.1	9.8	10.4	11.2	10.4	11.0	12.0	11.8	12.6	13.3	13.6	14.2	15.0	15.2	15.0	14.0	13.7	12.3	11.1	10.6	11.0	12.0
Norfolk, Va	6.0	5.8	5.7	5.5	5.3	5.2	5.0	6.4	7.4	7.6	6.9	7.6	8.6	8.5	9.0	9.6	9.1	8.5	7.7	7.8	7.3	7.1	7.0	6.5	7.1
Northfield, Vt	5.8	5.5	5.5	5.9	5.2	5.0	4.8	5.5	7.6	8.6	8.9	10.5	11.7	12.0	11.6	10.3	9.3	8.6	6.6	6.9	6.8	7.0	6.2	5.9	7.6
North Platte, Nebr	9.1	8.6	7.8	7.9	7.5	8.1	7.6	7.8	8.2	10.3	11.1	11.6	12.0	12.7	13.1	12.6	12.6	12.7	12.4	11.0	9.1	8.6	9.0	9.2	10.0
Oklahoma, Okla	8.8	8.5	8.9	9.0	9.1	9.5	8.9	9.0	10.1	10.7	10.8	11.1	10.7	11.4	11.7	11.7	11.0	10.7	10.1	8.3	7.6	8.0	8.5	8.5	9.7
Omaha, Nebr	6.9	6.6	6.8	6.6	6.0	6.6	7.2	6.9	7.1	8.4	9.0	9.7	10.7	10.5	10.5	10.9	10.2	9.2	8.2	6.7	6.3	6.4	6.5	6.4	7.9
Oswego, N. Y	9.3	9.1	9.0	9.3	9.3	9.4	9.3	9.9	10.3	10.2	10.2	10.6	11.0	10.9	10.0	10.0	9.2	8.1	7.4	7.5	7.9	8.2	8.7	8.4	9.3
Palestine, Tex	6.3	6.4	6.1	6.4	6.3	6.0	5.8	5.7	6.2	7.2	7.9	8.7	9.1	9.1	8.7	8.6	7.8	7.6	6.6	5.8	4.8	6.2	6.9	6.4	6.9
Parkersburg, W. Va	3.5	3.2	3.3	3.3	3.4	3.1	3.1	3.3	3.8	4.7	5.8	6.2	6.7	7.6	7.2	6.7	6.5	5.3	3.2	2.6	2.9	3.3	3.4	3.4	4.4
Pensacola, Fla	9.3	9.1	9.3	9.5	9.7	9.7	9.8	10.4	10.4	10.9	11.8	11.1	11.2	12.0	12.2	12.3	11.6	11.9	10.4	9.3	9.0	9.1	8.8	9.0	10.3
Phenix, Ariz	3.7	3.7	3.6	3.6	3.3	3.1	3.0	3.0	3.0	3.3	4.0	4.5	4.8	5.3	5.4	5.8	6.2	6.2	6.6	5.5	4.4	4.5	4.7	4.0	4.4
Philadelphia, Pa	7.0	7.3	7.8	7.7	7.7	7.3	7.8	8.1	9.3	9.7	9.3	9.1	9.5	9.7	9.6	9.5	9.4	8.8	8.6	8.3	7.8	7.0	7.4	7.0	8.4
Pierre, S. Dak	12.2	11.5	10.4	10.8	10.7	10.1	9.9	9.9	11.1	13.4	14.8	15.0	14.8	15.6	16.0	16.3	16.8	15.9	15.5	13.9	13.0	13.0	13.9	13.7	13.3
Pittsburg, Pa	3.9	4.0	3.8	4.1	4.1	4.0	4.2	4.3	4.6	5.2	6.2	6.7	7.8	7.5	8.0	7.7	7.1	7.2	5.7	5.1	5.0	4.5	4.2	4.1	5.4
Pocatello, Idaho	10.7	10.5	10.8	9.9	9.7	9.4	9.7	9.7	9.7	10.4	11.0	11.4	11.3	11.1	11.4	12.6	13.0	12.5	12.5	11.8	9.2	8.0	8.9	10.4	10.7
Point Reyes Lt., Cal	14.8	14.6	14.2	12.7	11.8	11.4	10.8	10.7	10.1	9.8	9.8	9.3	10.2	10.7	10.8	12.7	13.4	13.3	14.2	14.8	15.3	15.3	15.7	15.4	12.4
Port Crescent, Wash	2.4	2.5	2.5	2.1	2.0	2.1	2.2	2.4	2.3	2.4	2.3	3.7	4.8	5.8	5.8	5.9	5.9	5.7	5.5	4.9	3.9	3.2	2.8	2.7	3.6
Port Huron, Mich	9.6	10.1	10.3	9.5	9.8	9.2	8.7	8.4	9.3	10.1	10.8	11.4	12.1	12.8	12.3	11.6	11.1	10.3	9.5	9.6	9.7	9.2	9.0	9.4	10.2
Portland, Me	4.7	4.4	4.2	4.5	4.6	4.4	4.9	5.7	6.6	7.4	8.3	8.2	9.2	9.6	9.6	9.9	9.2	7.3	5.4	5.4	5.0	5.0	4.9	4.9	6.4
Portland, Oreg	7.6	7.7	6.7	6.2	6.0	5.9	5.7	5.8	5.7	6.1	6.1	6.3	7.1	7.4	8.0	8.6	8.4	9.1	9.3	9.6	8.5	8.3	7.9	8.1	7.3
Pueblo, Colo	6.6	5.6	5.6	5.3	4.9	5.1	5.2	5.0	4.8	4.4	4.9	5.5	6.7	7.3	8.0	8.6	8.8	9.2	9.4	9.6	7.9	7.4	6.7	6.5	6.6
Raleigh, N. C	3.0	2.7	3.3	2.8	2.8	2.9	2.8	3.4	4.0	4.7	5.1	5.4	5.4	5.5	6.1	5.8	5.3	4.6	3.3	3.3	3.3	3.6	3.6	3.6	4.0
Rapid City, S. Dak	6.8	6.9	6.6	5.3	5.8	5.9	6.4	8.0	8.2	8.8	9.4	11.4	12.5	12.5	12.7	12.1	11.4	10.9	10.3	8.9	7.3	7.4	8.1	7.4	8.8
Red Bluff, Cal	6.4	6.1	6.0	6.3	5.8	6.0	5.7	5.8	5.2	5.4	6.8	8.1	8.9	9.1	8.4	9.0	9.5	8.8	9.0	8.6	7.9	7.9	7.8	6.9	7.3
Richmond, Va	3.4	3.5	3.7	3.6	3.4	3.4	3.6	4.0	4.6	4.9	5.4	5.1	5.3	5.2	5.3	5.1	4.8	4.6	4.0	3.8	3.6	3.7	3.5	3.6	4.2
Rochester, N. Y	6.1	6.1	5.9	6.3	6.6	6.4	6.3	7.0	7.8	8.2	8.3	9.0	9.5	9.5	9.4	8.9	7.9	6.1	5.0	5.1	4.9	4.8	5.1	5.5	6.9
Roseburg, Oreg	2.3	2.0	2.1	2.0	2.0	2.0	2.0	2.0	1.9	2.0	2.1	2.5	3.2	3.8	4.9	5.4	6.0	6.5	7.2	7.6	6.6	4.7	3.5	2.3	3.6
Sacramento, Cal	10.0	9.2	8.3	8.5	9.3	9.1	9.0	8.8	8.5	7.6	7.4	8.1	8.7	8.7	9.3	9.4	9.9	10.1	10.5	10.7	9.6	9.8	10.6	9.4	9.2
St. Louis, Mo	7.6	8.0	7.8	7.8	7.4	7.4	7.2	7.7	7.6	8.7	9.2	9.6	9.7	9.9	9.6	9.5	9.8	9.9	9.2	7.7	7.4	8.0	7.9	8.0	8.4
St. Paul, Minn	6.7	6.6	6.8	6.3	6.5	6.2	6.0	5.7	6.8	7.8	8.8	9.1	9.8	10.8	10.5	10.0	10.0	9.4	8.6	7.1	7.2	7.3	7.4	7.3	7.9
Salt Lake City, Utah	4.8	4.7	5.1	5.0	4.8	4.6	4.4	4.1	3.9	3.6	3.8	5.3	7.8	9.0	10.3	10.5	10.1	10.3	10.5	9.2	7.1	6.2	6.2	5.3	6.5
San Antonio, Tex	6.7	6.0	5.2	5.2	5.0	5.0	4.8	5.0	5.7	7.3	8.3	9.1	9.9	9.6	9.7	9.6	9.9	9.7	9.5	8.9	8.6	8.4	8.1	7.4	7.6
San Diego, Cal	3.5	3.6	3.5	3.6	3.9	3.7	3.5	3.4	3.3	3.4	3.2	4.5	7.0	8.6	10.2	11.2	11.5	11.1	10.4	9.7	8.2	6.2	4.4	3.4	6.0
Sandusky, Ohio	6.9	6.7	7.1	7.3	7.3	6.8	6.7	6.4	6.9	7.6	8.2	8.6	8.9	8.9	8.9	9.4	8.4	7.6	6.3	6.4	6.6	6.5	6.8	7.0	7.0
San Francisco, Cal	9.6	9.1	8.4	8.1	7.7	7.2	6.7	6.0	5.8	5.9	6.9	7.3	8.3	10.3	12.4	13.7	16.1	18.5	18.9	18.9	18.1	15.1	12.3	10.6	10.9
San Luis Obispo, Cal	2.0	2.0	2.0	2.5	3.3	3.6	4.1	3.9	2.7	2.5	3.0	4.7	5.5	6.7	7.5	8.6	10.7	10.9	10.3	8.5	6.6	5.2	3.5	2.2	5.1
Santa Fe, N. Mex	6.2	6.5	5.4	5.2	4.9	4.3	4.5	3.8	3.7	4.6	5.5	7.0	7.7	8.3	8.6	8.8	8.9	9.4	9.7	8.3	6.5	6.9	7.7	7.3	6.7
Sault Ste. Marie, Mich	5.8	5.6	5.3	5.6	5.6	5.7	5.4	5.5	6.2	7.4	8.3	8.7	9.7	11.1	10.8	10.6	10.4	10.2	8.3	7.0	6.9	6.9	6.1	6.0	7.5
Savannah, Ga	4.9	4.8	4.6	4.6	4.6	4.8	4.7	5.4	6.8	8.4	8.8	9.1	9.4	10.4	10.1	9.6	8.8	7.9	6.7	5.7	5.5	5.5	5.2	4.8	6.7
Seattle, Wash	2.9	3.3	2.7	2.5	2.5	2.8	3.3	3.0	3.1	3.5	3.7	8.7	4.3	5.0	5.6	5.9	6.0	6.2	6.5	6.0	5.3	4.0	3.6	2.7	4.1
Shreveport, La	5.4	4.7	4.8	4.7	4.5	4.5	4.9	4.8	5.8	6.8	7.2	7.6	8.3	8.2	8.0	8.1	7.8	7.4	5.8	5.1	5.0	5.6	5.8	5.2	6.1
Sioux City, Iowa	11.9	11.1	11.4	10.8	10.4	11.3	11.5	11.9	13.0	14.2	14.9	15.7	16.6	17.1	17.1	17.1	16.5	15.6	13.7	12.3	11.9	12.2	11.9	12.3	13.4
Spokane, Wash	4.8	4.6	4.6	4.5	4.5	4.7	4.4	4.2	4.1	4.0	4.7	5.5	6.2	6.8	6.5	6.8	6.6	7.0	7.3	7.5	6.1	5.1	5.1	4.8	5.4
Springfield, Ill	7.3	7.2	7.4	7.4	7.3	7.6	7.9	7.5	8.1	9.3	9.5	9.7	9.8	10.0	9.7	9.1	9.2	8.8	7.5	7.1	7.1	7.8	7.6	7.6	8.2
Springfield, Mo	9.0	8.9	8.7	8.4	8.5	8.9	8.7	9.1	10.1	10.5	10.8	10.3	10.5	9.9	9.8	9.4	9.3	9.3	8.3	8.1	8.8	9.1	9.2	9.3	9.3
Tacoma, Wash	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......
Tampa, Fla	5.2	5.3	5.5	5.3	4.9	5.2	5.8	6.7	8.3	9.3	9.2	9.1	9.0	9.3	9.2	9.6	9.2	8.2	6.7	6.6	6.6	6.4	5.9	5.3	7.2
Toledo, Ohio	8.4	8.8	7.8	7.2	7.2	7.2	7.4	7.6	8.3	9.4	10.5	10.8	11.0	11.4	11.5	11.3	10.7	10.2	8.4	7.7	7.9	7.9	8.5	8.6	9.0
Valentine, Nebr	9.5	9.0	9.8	9.6	8.9	9.8	9.2	8.6	9.8	13.0	14.4	14.6	14.9	15.9	16.0	15.7	15.3	14.9	13.4	11.1	9.5	9.3	9.1	8.8	11.7
Vicksburg, Miss	5.6	5.6	5.3	5.1	5.0	4.8	4.9	5.4	5.6	6.2	6.5	6.7	7.3	7.3	7.1	7.6	6.6	6.0	4.5	4.1	5.2	5.5	5.6	5.8	5.8
Walla Walla, Wash	5.0	4.8	4.7	4.5	4.7	4.4	4.3	4.4	4.3	4.4	4.4	5.0	6.0	5.9	5.8	5.8	5.4	5.8	5.6	5.6	4.8	4.3	5.5	5.9	5.1
Washington, D. C	3.3	4.0	3.6	4.0	3.9	4.0	4.2	4.8	5.9	6.4	7.1	6.8	7.3	7.4	7.8	7.1	7.0	5.7	4.8	4.3	4.1	4.2	4.1	3.8	5.2
Wichita, Kans.*	8.3	8.0	7.9	7.3	7.2	7.0	7.1	7.4	8.5	9.3	10.0	10.7	10.2	10.5	10.8	10.4	10.8	10.5	9.3	8.4	8.5	8.0	8.5	8.5	8.5
Williston, N. Dak	9.4	9.6	9.8	9.3	8.7	8.5	9.6	9.4	9.7	9.6	11.1	12.3	12.8	13.0	13.3	13.1	12.6	11.9	11.8	10.6	9.6	9.4	9.1	9.5	10.6
Wilmington, N. C	4.8	4.9	4.7	4.8	5.0	5.0	5.2	5.5	6.5	7.1	7.5	8.2	9.3	9.2	9.2	9.5	8.9	7.9	6.2	5.5	5.2	4.9	4.9	4.8	6.4
Winnemucca, Nev	6.7	7.7	7.5	7.9	7.8	7.6	7.6	8.4	7.7	8.0	8.2	9.0	8.9	8.7	8.3	9.5	10.5	10.8	9.8	8.8	7.9	6.9	6.1	6.7	8.2
Yankton, S. Dak	8.4	8.5	8.5	7.7	8.1	7.6	7.8	7.6	8.4	9.0	10.2	11.7	14.5	13.8	14.2	13.7	13.1	12.7	11.2	8.6	7.6	7.1	7.4	7.5	9.8
West Indies.																									
Basseterre, St. Kitts	8.8	9.0	8.8	9.0	9.1	9.2	10.3	11.5	11.7	11.8	11.8	11.8	11.8	11.5	11.5	10.3	9.3	8.7	8.5	8.8	9.3	9.5	9.3	9.3	10.0
Bridgetown, Bar	5.0	5.1	5.8	5.5	5.4	5.1	7.4	10.5	11.7	12.3	12.4	12.4	12.4	11.3	11.0	9.8	8.1	6.1	5.8	5.7	5.7	5.5	4.9	5.3	7.9
Cienfuegos, Cuba	5.6	5.8	6.0	5.5	5.1	5.2	5.8	6.0	6.8	8.2	8.7	9.0	9.8	9.7	10.3	10.1	9.3	8.2	6.7	6.5	6.3	6.2	5.9	5.8	7.2
Havana, Cuba	6.8	6.2	5.9	5.8	5.4	5.5	5.5	6.2	8.3	10.8	11.0	12.0	12.7	14.3	14.5	14.8	13.9	12.9	10.8	10.5	9.2	8.5	7.6	7.3	9.4
Kingston, Jamaica	4.6	4.6	4.7	4.7	4.9	5.3	4.7	3.9	3.4	4.9	6.2	8.0	9.1	9.3	8.4	7.5	6.8	4.6	3.5	3.7	4.0	3.9	4.1	4.5	5.4
Port of Spain, Trin	1.8	1.9	1.7	1.9	1.8	1.7	2.2	4.8	6.6	7.4	7.5	7.0	7.5	7.6	7.0	6.7	5.6	4.4	3.7	3.3	2.8	2.6	2.2	1.8	4.2
Puerto Principe, Cuba	3.7	3.8	3.7	3.5	3.9	4.2	3.8	5.5	8.8	9.5	9.1	9.1	9.7	9.5	9.8	10.4	9.3	8.3	6.8	5.6	4.7	4.4	4.5	4.2	6.5
Roseau, Dominica	4.5	4.7	4.4	4.5	4.8	4.7	4.3	4.4	5.8	6.2	6.6	6.9	6.7	6.9	6.7	6.3	5.2	4.1	3.7	4.0	4.4	4.6	4.8	4.4	5.2
San Juan, Porto Rico	6.5	6.6	6.4	6.2	6.5	6.5	6.8	7.7	10.0	12.6	14.0	14.7	14.2	14.3	13.8	13.2	11.9	11.0	9.5	8.4	8.2	7.6	7.6	7.3	9.6
Santiago de Cuba	2.1	2.2	2.1	2.2	2.2	2.2	1.9	2.8	4.1	4.5	4.9	4.8	5.1	5.5	5.2	4.8	3.7	2.9	2.3	2.8	2.8	2.6	2.9	2.5	3.3
Santo Domingo, S. D	4.1	4.2	4.5	4.7	4.7	5.0	5.0	5.2	5.5	5.6	6.1	6.7	6.5	7.0	7.3	6.5	6.0	5.1	4.3	4.9	4.6	4.5	4.1	4.0	5.3
Willemstad, Curaçao	10.2	10.0	9.6	9.5	8.8	8.8	9.9	11.9	12.9	13.0	13.6	14.0	13.8	13.5	14.0	14.5	14.6	14.1	13.3	12.9	12.1	11.7	11.4	10.6	12.0

*Record for twenty-four days.

TABLE VI.—*Resultant winds from observations at 8 a. m. and 8 p. m., daily, during the month of September, 1900.*

Stations.	Component direction from—				Resultant.	
	N.	S.	E.	W.	Direction from—	Duration.
New England.	*Hours.*	*Hours.*	*Hours.*	*Hours.*	°	*Hours.*
Eastport, Me	20	21	6	26	s. 87 w.	20
Portland, Me	19	22	5	27	s. 82 w.	22
Northfield, Vt	16	41	3	5	s. 5 w.	25
Boston, Mass	18	18	13	25	w.	12
Nantucket, Mass	17	23	16	20	s. 34 w.	7
Block Island, R. I	12	21	19	23	s. 24 w.	10
New Haven, Conn	21	22	13	21	s. 83 w.	8
Middle Atlantic States.						
Albany, N. Y	21	24	4	19	s. 79 w.	15
Binghamton, N. Y.†	13	8	2	11	n. 61 w.	10
New York, N. Y	18	22	17	19	s. 27 w.	4
Harrisburg, Pa.†	13	4	10	9	n. 6 e.	9
Philadelphia, Pa	16	18	19	20	s. 27 w.	2
Scranton, Pa	21	14	20	19	n. 8 e.	1
Atlantic City, N. J	15	24	16	20	s. 24 w.	10
Cape May, N. J.	16	23	19	17	s. 16 e.	7
Baltimore, Md	20	16	22	14	n. 63 e.	9
Washington, D. C	19	20	20	13	s. 82 w.	7
Lynchburg, Va	7	27	13	23	s. 27 w.	22
Norfolk, Va	9	32	22	13	s. 21 e.	25
Richmond, Va	15	32	15	10	s. 16 e.	18
South Atlantic States.						
Charlotte, N. C	17	24	24	10	s. 63 e.	16
Hatteras, N. C	23	16	25	12	n. 62 e.	15
Kittyhawk, N. C.*	8	13	13	6	s. 54 e.	9
Raleigh, N. C	19	25	12	16	s. 34 w.	7
Wilmington, N. C	19	16	20	12	n. 69 e.	8
Charleston, S. C	15	15	28	11	e.	17
Augusta, Ga	15	22	29	7	s. 72 e.	23
Savannah, Ga	20	16	27	13	n. 74 e.	15
Jacksonville, Fla	14	14	37	5	e.	32
Florida Peninsula.						
Jupiter, Fla	21	12	41	3	n. 77 e.	39
Key West, Fla	13	13	36	7	e.	29
Tampa, Fla	27	9	29	9	n. 48 e.	27
Eastern Gulf States.						
Atlanta, Ga	15	17	26	16	s. 79 e.	10
Macon, Ga†	12	4	14	2	n. 56 e.	14
Pensacola, Fla.†	14	4	14	4	n. 45 e.	14
Mobile, Ala	25	16	16	13	n. 18 w.	10
Montgomery, Ala	19	10	34	8	s. 71 e.	28
Meridian, Miss.†	10	7	14	4	n. 73 e.	10
Vicksburg, Miss	14	23	33	6	s. 62 e.	19
New Orleans, La	16	22	30	9	s. 74 e.	22
Western Gulf States.						
Shreveport, La	14	26	29	9	s. 59 e.	23
Fort Smith, Ark	13	7	43	4	n. 81 e.	40
Little Rock, Ark	24	18	11	9	s. 18 e.	6
Corpus Christi, Tex	11	18	21	23	s. 16 w.	7
Fort Worth, Tex†	6	17	8	7	s. 5 e.	11
Galveston, Tex	7	26	32	6	s. 54 e.	32
Palestine, Tex	10	39	12	9	s. 6 e.	29
San Antonio, Tex	14	25	37	2	s. 73 e.	37
Ohio Valley and Tennessee.						
Chattanooga, Tenn	18	22	21	17	s. 45 e.	6
Knoxville, Tenn	26	17	20	13	n. 38 e.	11
Memphis, Tenn	21	18	22	6	n. 79 e.	16
Nashville, Tenn	23	16	15	19	n. 30 w.	8
Lexington, Ky†	6	16	8	5	s. 17 e.	10
Louisville, Ky	25	24	10	13	n. 72 w.	3
Evansville, Ind.†	12	11	11	2	n. 84 e.	9
Indianapolis, Ind	25	18	12	17	n. 21 w.	14
Cincinnati, Ohio	23	17	21	19	n. 18 e.	6
Columbus, Ohio	21	19	16	17	n. 27 w.	2
Pittsburg, Pa	28	14	11	21	n. 36 w.	17
Parkersburg, W. Va	17	26	9	21	s. 53 w.	15
Elkins, W. Va	24	12	9	25	n. 53 w.	20
Lower Lake Region.						
Buffalo, N. Y	16	20	12	22	s. 68 w.	11
Oswego, N. Y	13	25	18	20	s. 9 w.	12
Rochester, N. Y	14	22	11	27	s. 63 w.	18
Erie, Pa	12	27	12	22	s. 34 w.	18
Cleveland, Ohio	16	26	21	14	s. 35 e.	12
Sandusky, Ohio	9	25	18	18	s.	16
Toledo, Ohio	15	20	16	21	s. 45 w.	7
Detroit, Mich	19	21	17	19	s. 45 w.	3
Upper Lake Region.						
Alpena, Mich	19	22	8	27	s. 81 w.	19
Escanaba, Mich	19	23	9	22	s. 73 w.	14
Grand Haven, Mich	17	22	14	24	s. 63 w.	11
Houghton, Mich†	8	8	7	15	w.	8
Marquette, Mich	22	20	10	26	n. 83 w.	16
Port Huron, Mich	19	20	16	16	s.	1
Sault Ste. Marie, Mich	15	19	22	20	s. 27 e.	4
Chicago, Ill	12	25	17	20	s. 14 w.	13
Milwaukee, Wis.	15	20	10	26	s. 72 w.	17
Green Bay, Wis	13	25	14	23	s. 37 w.	15
Duluth, Minn	24	15	12	28	n. 61 w.	18
North Dakota.						
Moorhead, Minn	18	21	21	19	s. 34 e.	4
Bismarck, N. Dak	30	12	15	17	n. 6 w.	18
Williston, N. Dak	28	14	14	14	n.	14
Upper Mississippi Valley.	*Hours.*	*Hours.*	*Hours.*	*Hours.*	°	*Hours.*
St. Paul, Minn	13	28	9	23	s. 43 w.	2
La Crosse, Wis.†	4	21	6	5	s. 3 e.	17
Davenport, Iowa	11	18	21	23	s. 16 w.	7
Des Moines, Iowa	15	27	15	14	s. 5 e.	12
Dubuque, Iowa	14	26	19	20	s. 5 w.	12
Keokuk, Iowa	15	27	18	17	s. 5 e.	12
Cairo, Ill	7	24	19	10	s. 28 e.	19
Springfield, Ill	22	23	14	14	s.	1
Hannibal, Mo†	3	14	10	8	s. 10 e.	11
St. Louis, Mo	22	20	19	6	n. 81 e.	13
Missouri Valley.						
Columbia, Mo.*	8	11	13	7	s. 68 e.	7
Kansas City, Mo	17	26	22	7	s. 29 e.	10
Springfield, Mo	12	26	24	4	s. 55 e.	24
Lincoln, Nebr	18	26	24	9	s. 62 e.	17
Omaha, Nebr	18	23	24	8	s. 73 e.	17
Valentine, Nebr	21	25	9	16	s. 60 w.	8
Sioux City, Iowa†	7	14	10	6	s. 3 e.	8
Pierre, S. Dak	21	14	24	16	n. 49 e.	11
Huron, S. Dak	16	20	22	16	s. 56 e.	7
Yankton, S. Dak†	10	12	6	8	s. 45 w.	3
Northern Slope.						
Havre, Mont	19	16	13	30	n. 80 w.	17
Miles City, Mont	25	14	18	13	n. 24 e.	12
Helena, Mont	16	20	5	32	s. 82 w.	27
Kalispell, Mont	20	18	10	26	n. 83 w.	16
Rapid City, S. Dak	20	17	19	21	n. 34 w.	4
Cheyenne, Wyo	18	22	8	24	s. 76 w.	16
Lander, Wyo	12	25	7	32	s. 63 w.	28
North Platte, Nebr	16	21	20	16	s. 39 e.	6
Middle Slope.						
Denver, Colo	21	24	13	15	s. 34 w.	4
Pueblo, Colo	20	13	21	20	n. 8 e.	7
Concordia, Kans	9	31	25	6	s. 41 e.	29
Dodge, Kans	15	28	29	8	s. 50 e.	25
Wichita, Kans	13	30	22	3	s. 48 e.	26
Oklahoma, Okla	12	33	23	2	s. 45 e.	30
Southern Slope.						
Abilene, Tex	10	30	31	8	s. 48 e.	30
Amarillo, Tex	10	31	17	5	s. 5 e.	21
Southern Plateau.						
El Paso, Tex	16	10	27	21	n. 45 e.	8
Santa Fe, N. Mex	10	30	25	10	s. 37 e.	25
Flagstaff, Ariz	15	22	5	29	s. 74 w.	25
Phenix, Ariz	10	17	22	22	s.	7
Independence, Cal	16	22	12	24	s. 63 w.	13
Middle Plateau.						
Carson City, Nev	16	18	10	25	s. 82 w.	15
Winnemucca, Nev	20	14	17	19	n. 18 w.	6
Cedar City, Utah	10	34	19	16	s. 7 e.	24
Salt Lake City, Utah	14	25	21	16	s. 24 e.	12
Grand Junction, Colo	15	18	23	19	s. 53 w.	5
Northern Plateau.						
Baker City, Oreg	24	21	9	11	s. 45 w.	3
Boise, Idaho	18	16	15	25	n. 79 w.	10
Pocatello, Idaho	10	31	6	20	s. 34 w.	25
Spokane, Wash	11	27	13	23	s. 32 w.	19
Walla Walla, Wash	12	30	12	13	s. 3 w.	18
North Pacific Coast Region.						
Neah Bay, Wash	10	9	17	27	n. 84 w.	10
Port Crescent, Wash*	1	3	12	15	s. 56 w.	4
Seattle, Wash	19	18	18	20	n. 45 w.	3
Tacoma, Wash	31	15	5	18	n. 39 w.	21
Astoria, Oreg	16	24	7	25	s. 66 w.	20
Portland, Oreg	17	19	10	31	s. 85 w.	21
Roseburg, Oreg	29	8	20	16	s. 11 e.	21
Middle Pacific Coast Region.						
Eureka, Cal	25	17	7	28	n. 69 w.	22
Mount Tamalpais, Cal	15	10	5	40	n. 82 w.	35
Red Bluff, Cal	28	21	15	5	n. 55 e.	12
Sacramento, Cal	21	27	10	19	s. 56 w.	11
San Francisco, Cal	4	20	1	47	s. 71 w.	49
South Pacific Coast Region.						
Fresno, Cal	42	0	6	36	n. 35 w.	52
Los Angeles, Cal	18	10	10	31	n. 69 w.	22
San Diego, Cal	29	10	6	30	n. 51 w.	31
San Luis Obispo, Cal	20	8	6	31	n. 64 w.	28
West Indies.						
Basseterre, St. Kitts Island	11	7	48	1	n. 85 e.	47
Bridgetown, Barbados	7	15	48	0	s. 81 e.	49
Cienfuegos, Cuba	27	12	38	2	n. 68 e.	39
Havana, Cuba	14	7	47	3	n. 81 e.	45
Kingston, Jamaica	36	6	35	0	n. 49 e.	46
Port of Spain, Trinidad	11	5	50	1	n. 83 e.	50
Puerto Principe, Cuba	23	9	38	2	n. 69 e.	39
Roseau, Dominica, W. I	23	9	36	9	n. 63 e.	30
San Juan, Porto Rico	4	27	38	4	s. 56 e.	41
Santiago de Cuba, Cuba	24	21	25	5	n. 81 e.	20
Santo Domingo, S. Domingo, W. I.	43	9	13	5	n. 13 e.	34
Turks Island, W. I.†	7	11	21	2	s. 78 e.	19
Willemstad, Curaçao	3	10	55	0	s. 52 e.	55

*From observations at 8 p. m. only.

†From observations at 8 a. m. only.

TABLE VII.—*Thunderstorms and auroras, September, 1900.*

States.	No. of stations.		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total. No.	Total. Days.	
Alabama	52	T.	2	1						2			1	1		1		1				2												11	8	T.
		A.																																0	0	A.
Arizona	56	T.	6	5				1	3	2									1	2	2		7	5	3	1								38	12	T.
		A.																																0	0	A.
Arkansas	57	T.	2	10	2				2		2	2	2	13				7	3	2	6	6	2	1	3	1	1	2	3	2	1	1		76	23	T.
		A.																																0	0	A.
California	167	T.	2	3	4	3	1		4			3	4	13	6																			43	10	T.
		A.																																0	0	A.
Colorado	81	T.	1		7	6		2	3	8	12	10	13	5	2	1	1		1				2	1	5	7	4					1		92	20	T.
		A.																																0	0	A.
Connecticut	21	T.						9	1					2				4	1				5	1				3	1	1				28	10	T.
		A.																																0	0	A.
Delaware	5	T.				1				1								1																3	3	T.
		A.																																0	0	A.
Dist. of Columbia	4	T.				1			1																				1					3	3	T.
		A.																																0	0	A.
Florida	47	T.	7	6	5	4	3	4	6	1		1	2	1	6	7	6	4	2	1	1	1	1	1	1	1	1	1	1	1	4	4		84	29	T.
		A.																																0	0	A.
Georgia	55	T.	6	2		4	1	1	1						3	4	5														1	1		29	11	T.
		A.																																0	0	A.
Idaho	34	T.			1	1	3		2	1		3			3			2						2						1				19	11	T.
		A.																																0	0	A.
Illinois	92	T.	24	35	3			3	2	1					3	1	1	18		10	31	2		5	1	1	3	21	4	7	1			177	21	T.
		A.																																0	0	A.
Indiana	58	T.	8	5				5					1				1				6						1	10	2		5			44	10	T.
		A.																																0	0	A.
Indian Territory	11	T.			2							1	1	3	1						1	4	2		4				1					20	10	T.
		A.																																0	0	A.
Iowa	149	T.	7	10		1	2	1		3		1	1	1	4	10	7		1	20	11			13	2	1	14	9		4				123	24	T.
		A.																																0	0	A.
Kansas	77	T.	1	8	1	1			1		1	3	2	9	2	13	2	8	6	8	7			3	1		4	9	2	7				99	22	T.
		A.																																0	0	A.
Kentucky	41	T.	5	3	4				1						2	2					2			1					3		3			26	10	T.
		A.																																0	0	A.
Louisiana	46	T.	6	7	7	1	1		3		5	1	1	5	2	2			2			2	1	2			2	1				1		52	19	T.
		A.																																0	0	A.
Maine	19	T.			1																		7	2				2	2					14	5	T.
		A.																																0	0	A.
Maryland	48	T.		2	1	2			8	1				1		4	4	3		2					1			5	10	2	2			48	15	T.
		A.																																0	0	A.
Massachusetts	48	T.						2	1								1	1	6	1			12	1				3	3			1		32	11	T.
		A.																																0	0	A.
Michigan	106	T.	3	20	8	1	10	4			1	9	4				4	2				2	1	1		1	3	2						78	17	T.
		A.																																0	0	A.
Minnesota	67	T.	7	17		4	6		1	5	13	8	4	1		17	5		1	2	1	1		8		6	2	1						110	20	T.
		A.																																0	0	A.
Mississippi	41	T.	9	5	3	4		1	3	3	3			3	1			1	3	2	1	5		1	2						1	1		52	19	T.
		A.																																0	0	A.
Missouri	95	T.	18	24	7	3		2	1			2	5	14	1	9	16	9	4	23	23	1		9	5	7	6	21	12	17	4			243	25	T.
		A.																																0	0	A.
Montana	40	T.	1						2	2			3		3	3								1	1									16	8	T.
		A.																																0	0	A.
Nebraska	142	T.	1			8		2	1	1	2	7	2		4	20	1	3	2	12			2	15	3	3	5	2	3	5	1	1		106	6	T.
		A.																																0	0	A.
Nevada	40	T.		1	2	1	1								1						1	1			2	1	1							12	10	T.
		A.																																0	0	A.
New Hampshire	19	T.			1	1		4						3					1				5	1				6	8		1			31	12	T.
		A.																																0	0	A.
New Jersey	51	T.			1	5		7	8				3					5					1						14	1				45	9	T.
		A.																																0	0	A.
New Mexico	31	T.	1	2			1	2	2	2	2		1	3					1	1			2	1	1							1		23	15	T.
		A.																																0	0	A.
New York	99	T.			30	3	1	32	2					2				22	2			1	12				2	4	13					126	13	T.
		A.																												1				1	1	A.
North Carolina	56	T.		1		5									6	3	8	3					2	1				4		4	1			38	11	T.
		A.																																0	0	A.
North Dakota	48	T.	1	1		1	2	1	6	1	2	1				7		1		1	1		1	1	1	4								33	17	T.
		A.															1													2				3	2	A.
Ohio	128	T.		2	14		1	18	3										1			2						9	6	1	8			65	11	T.
		A.																																0	0	A.
Oklahoma	23	T.	1	1	5						1	1	1	5	4						3	6				2		7	2					39	13	T.
		A.																																0	0	A.
Oregon	74	T.				1	3	6	4			2		3	1	1	2				1													24	10	T.
		A.																																0	0	A.
Pennsylvania	91	T.			12	7		3	1	1	1																		7					32	7	T.
		A.																																0	0	A.
Rhode Island	7	T.						1										1	2										1					5	4	T.
		A.																																0	0	A.
South Carolina	46	T.	8	4		1	1								8	4	9	1												2		7		45	10	T.
		A.																																0	0	A.
South Dakota	56	T.	4	2		2			5	4	2	6	1	2	1	8				1	1	1	2	7		3								52	17	T.
		A.																						1										1	1	A.
Tennessee	56	T.	8	1	1	1								4	3	1	1	1			1	5		4	1				1					33	14	T.
		A.																																0	0	A.
Texas	95	T.	6	2	1	3	5	2		1	3			1					1	1		5	8	3	8	1	1			1				53	22	T.
		A.																																0	0	A.
Utah	47	T.			8	7				2	2	6	1												2	1		2	2	1				34	11	T.
		A.																																0	0	A.
Vermont	16	T.			6			7					1	1						1	1	1	8					1	6					33	10	T.
		A.																																0	0	A.
Virginia	50	T.		3		5				1					3	3	5	1									1	4	9		1			36	11	T.
		A.																																0	0	A.
Washington	64	T.						1	9	3														9	1							1		24	6	T.
		A.																																0	0	A.
West Virginia	43	T.			2				2	2					2							2	1	1				5	9	2	4			32	11	T.
		A.																																0	0	A.
Wisconsin	60	T.	7	9	1	1	2			1	1		2	1		1	3				1	1		2		4	9	3		3				52	18	T.
		A.																																0	0	A.
Wyoming	31	T.			2	3	2			1	4	1	3	1		2	1	2	1		1	1		2	1	1						1		30	18	T.
		A.																																0	0	A.
Sums	2,893	T.	152	192	142	92	46	121	89	50	57	70	59	98	72	124	83	101	42	90	103	52	84	105	49	46	60	137	126	62	38	21	....	2,563	....	T.
		A.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	3	0	0	....	5	....	A.

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TABLE VIII.—*Average hourly sunshine (in percentages), September, 1900.*

Stations.	Instrument.	Percentages for each hour of local mean time ending with the respective hour.																Hours of sunshine.			
		A. M.								P. M.								Total.			Personal estimate.
		5	6	7	8	9	10	11	Noon	1	2	3	4	5	6	7	8	Actual.	Possible.	Percent of possible.	
																		Hours.	Hours.		
Albany, N. Y	T.	......	14	18	46	64	76	80	83	81	79	72	65	50	35	30	......	227.2	375.0	61	46
Atlanta, Ga	T.	......	46	64	73	67	79	79	80	85	86	80	77	77	55	30	......	275.1	371.8	74	62
Atlantic City, N. J	T.	......	41	39	53	72	83	84	86	88	90	78	73	67	52	65	......	265.9	373.4	71	56
Baltimore, Md	T.	......	41	37	56	68	72	74	79	80	70	67	62	45	38	45	......	230.6	373.4	62	49
Binghamton, N. Y	T.	......	16	15	20	36	55	59	60	61	63	58	44	47	41	44	......	171.7	374.5	46	41
Bismarck, N. Dak	P.	......	34	38	46	48	49	51	52	40	50	54	47	45	38	36	......	173.0	376.9	46	40
Boise, Idaho	P.	......	61	50	66	77	79	86	79	84	80	82	78	77	61	58	......	282.1	375.4	75	65
Boston, Mass	T.	......	43	50	57	65	65	67	66	68	67	61	57	56	46	61	......	225.1	374.5	60	52
Buffalo, N. Y	T.	......	39	31	49	67	77	82	80	86	80	72	63	51	37	52	......	239.1	375.0	64	85
Cedar City, Utah	T.	......	76	77	75	84	90	95	93	92	96	84	84	77	66	68	......	313.8	373.0	84	73
Charleston, S. C	T.	......	46	50	59	66	63	64	71	64	68	70	66	54	47	44	......	227.7	371.4	61	61
Chattanooga, Tenn	T.	......	55	57	61	73	82	78	82	77	81	71	69	62	46	62	......	259.2	372.0	70	61
Cheyenne, Wyo	P.	......	77	78	83	81	78	77	76	80	77	70	71	62	50	47	......	274.6	374.0	73	58
Chicago, Ill	T.	......	57	50	48	61	64	70	67	68	67	57	50	47	44	42	......	215.0	374.5	57	52
Cincinnati, Ohio	T.	......	58	47	55	76	82	88	92	94	95	87	81	75	55	44	......	284.8	373.4	76	52
Cleveland, Ohio	T.	......	48	40	42	56	68	69	73	77	75	72	69	66	63	73	......	239.1	374.5	64	52
Columbia, Mo	T.	......	72	61	69	71	73	74	77	80	82	82	75	70	75	73	......	276.1	373.4	74	54
Columbus, Ohio	T.	......	55	50	50	56	70	78	81	81	74	65	58	48	47	57	......	235.2	373.6	63	53
Denver, Colo	P.	......	72	71	79	81	82	83	86	90	81	69	60	59	47	50	......	275.6	373.6	74	59
Des Moines, Iowa	T.	......	44	47	43	46	52	59	61	59	66	69	67	52	36	41	......	203.1	374.5	54	45
Detroit, Mich	T.	......	34	36	49	61	66	72	69	74	69	69	68	40	28	34	......	215.2	374.5	57	54
Dodge, Kans	P.	......	42	52	66	66	71	73	70	70	74	77	70	69	53	42	......	248.0	373.0	66	54
Dubuque, Iowa	T.	......	49	49	56	61	63	67	73	74	76	70	61	48	32	19	......	224.5	374.5	60	55
Eastport, Me	P.	......	32	34	53	54	55	58	59	66	71	65	66	59	40	37	......	209.1	375.8	56	44
Elkins, W. Va	T.	......	0	0	10	44	60	66	70	72	69	69	67	37	7	15	......	171.8	373.4	46	46
Erie, Pa	T.	......	14	14	30	52	66	64	65	71	66	63	57	50	34	44	......	193.3	374.5	52	54
Escanaba, Mich	T.	......	26	33	42	47	52	54	50	49	50	45	28	23	21	17	......	152.1	376.1	40	40
Eureka, Cal	P.	......	20	25	31	48	54	59	69	78	74	71	74	65	54	50	......	214.3	374.0	57	57
Fresno, Cal	T.	......	75	77	88	95	96	99	98	97	100	97	92	85	74	67	......	338.6	372.6	91	84
Galveston, Tex.*	P.	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......	......
Grand Junction, Colo	P.	......	70	64	69	74	73	77	66	62	65	69	63	66	66	69	......	253.5	373.4	68	55
Harrisburg, Pa	T.	......	40	37	40	60	69	60	76	78	74	62	61	45	45	54	......	222.3	373.6	60	50
Helena, Mont	P.	......	55	54	53	58	58	54	60	64	66	67	67	57	48	39	......	219.9	376.9	58	48
Huron, S. Dak	T.	......	40	47	47	52	65	71	75	76	70	66	58	63	62	64	......	232.9	375.4	62	55
Indianapolis, Ind	T.	......	63	55	52	64	67	70	73	74	64	62	50	41	37	50	......	220.8	373.6	59	47
Jacksonville, Fla	T.	......	33	37	44	59	70	70	69	65	64	54	49	30	20	7	......	191.8	370.8	52	49
Jupiter, Fla	T.	......	31	57	71	76	71	77	79	79	71	68	60	36	14	3	......	229.6	369.4	62	47
Kalispell, Mont	T.	......	39	38	39	43	46	54	52	48	49	46	40	33	25	23	......	159.8	377.5	42	40
Kansas City, Mo	P.	......	50	42	47	56	59	55	51	50	49	54	58	61	60	73	......	200.4	373.4	54	46
Knoxville, Tenn	T.	......	61	50	60	68	83	86	89	87	83	78	73	70	55	58	......	272.2	372.2	73	69
Lexington, Ky	T.	......	66	59	67	78	83	86	91	90	90	89	85	71	55	72	......	292.1	373.0	78	55
Little Rock, Ark	T.	......	52	52	65	66	79	85	88	85	81	83	76	68	58	58	......	272.2	372.0	73	55
Los Angeles, Cal	P.	......	52	59	67	70	76	76	83	81	92	96	93	91	82	81	......	296.9	371.8	80	76
Louisville, Ky	T.	......	45	37	39	57	68	71	69	76	73	77	64	40	30	42	......	216.5	373.0	58	58
Macon, Ga	T.	......	54	66	76	87	93	97	95	92	93	92	88	84	72	47	......	315.9	371.4	85	71
Meridian, Miss	T.	......	71	73	74	79	80	82	80	81	83	73	76	64	65	48	......	280.3	371.4	75	67
Mount Tamalpais, Cal	P.	......	59	69	69	69	75	72	66	76	79	76	76	77	71	60	......	270.5	373.0	73	67
Nashville, Tenn	T.	......	60	58	74	87	91	86	87	95	92	90	84	79	65	71	......	303.8	372.2	82	60
New Haven, Conn	T.	......	46	43	68	74	85	91	94	96	93	84	74	60	43	59	......	278.9	374.0	75	62
New Orleans, La	T.	......	86	85	85	84	88	85	89	94	90	85	78	68	59	63	......	305.6	370.8	82	75
New York, N. Y	T.	......	35	36	50	69	74	85	83	84	78	71	66	59	50	67	......	248.3	374.0	66	51
Norfolk, Va	T.	......	34	43	67	76	79	85	91	89	87	87	81	73	45	48	......	276.3	372.6	74	68
Northfield, Vt	P.	......	48	37	46	60	61	59	53	52	51	56	50	43	24	30	......	184.1	375.4	49	36
Oklahoma, Okla	T.	......	40	34	41	54	56	68	70	77	72	74	65	58	41	58	......	217.9	372.0	59	40
Omaha, Nebr	T.	......	47	57	66	69	78	84	90	96	90	86	86	83	66	69	......	293.0	374.0	78	56
Parkersburg, W. Va	T.	......	26	17	32	56	67	74	80	79	72	68	65	53	22	42	......	210.6	373.4	56	55
Phenix, Ariz	P.	......	74	78	87	90	94	92	91	98	98	90	85	77	72	80	......	324.6	371.4	87	72
Philadelphia, Pa	T.	......	41	34	36	57	65	71	71	70	67	66	65	56	41	48	......	216.2	373.6	58	54
Pittsburg, Pa	T.	......	37	27	27	32	43	50	60	66	66	56	51	39	44	52	......	176.6	374.0	47	53
Pocatello, Idaho	T.	......	52	50	64	72	80	81	89	86	81	72	72	67	64	71	......	272.1	375.0	73	62
Portland, Me	T.	......	15	31	56	67	82	80	90	87	84	83	81	67	44	27	......	261.6	375.4	70	55
Portland, Oreg	T.	......	34	31	31	34	35	48	67	71	72	65	58	41	38	41	......	182.5	376.1	49	49
Pueblo, Colo	T.	......	67	70	84	86	90	91	90	92	93	92	89	80	59	58	......	312.7	373.0	84	63
Raleigh, N. C	T.	......	63	61	74	87	95	92	92	94	94	94	92	85	70	67	......	316.5	372.2	85	73
Rochester, N. Y	T.	......	38	32	34	54	67	68	73	76	77	73	56	38	34	46	......	210.7	375.0	56	50
St. Louis, Mo	T.	......	47	40	49	68	80	81	77	84	71	70	58	52	51	67	......	241.8	373.4	65	52
St. Paul, Minn	P.	......	15	20	37	50	51	53	53	54	51	57	58	56	40	46	......	178.1	375.8	47	45
Salt Lake City, Utah	T.	......	71	67	67	78	78	85	83	85	87	88	78	71	68	59	......	288.8	374.0	77	72
San Diego, Cal	P.	......	33	43	48	54	80	80	83	89	89	90	88	87	87	100	......	282.1	371.4	76	82
San Francisco, Cal	T.	......	60	67	70	78	84	87	87	95	92	93	89	87	77	72	......	309.9	373.0	83	74
Santa Fe, N. Mex	P.	......	59	68	67	71	79	80	81	77	72	62	63	57	56	42	......	255.7	372.2	69	59
Sault Ste. Marie, Mich	T.	......	19	15	34	40	52	64	63	67	61	61	61	56	34	22	......	185.4	376.1	49	39
Savannah, Ga	T.	......	63	74	78	84	89	88	87	83	75	73	61	60	51	50	......	277.7	371.4	75	65
Seattle, Wash	T.	......	14	10	18	28	37	53	56	63	69	63	53	48	32	34	......	162.9	377.5	43	42
Spokane, Wash	T.	......	47	40	36	44	56	63	64	62	61	52	42	30	24	39	......	180.6	377.5	48	43
Tacoma, Wash	T.	......	20	22	32	47	58	68	66	66	69	65	60	51	37	35	......	196.6	376.9	52	43
Tampa, Fla	T.	......	57	64	69	70	72	80	74	77	69	56	52	53	49	28	......	240.1	369.6	65	40
Toledo, Ohio	T.	......	55	51	56	70	77	79	80	79	79	76	64	54	44	66	......	251.6	374.5	67	43
Topeka, Kans	T.	......	46	43	44	46	56	53	62	63	65	61	51	56	61	62	......	205.2	373.4	55	61
Vicksburg, Miss	T.	......	76	77	83	87	93	97	95	94	89	88	86	79	66	59	......	318.6	371.4	86	69
Washington, D. C	P.	......	50	44	52	61	74	80	78	82	76	80	79	66	51	65	......	254.6	373.4	68	58
Wilmington, N. C	T.	......	83	87	87	91	89	92	96	99	93	88	89	81	71	70	......	328.1	371.8	88	74
Yankton, S. Dak	T.	......	13	27	39	49	57	65	71	73	75	70	64	57	38	32	......	208.2	375.0	56	53
Basseterre, St. Kitts	T.	......	37	41	71	90	98	96	81	86	81	79	64	60	28	14	......	264.5	367.1	72	49
Bridgetown, Barbados	T.	......	40	54	86	92	95	93	90	87	83	79	78	74	49	20	......	290.2	366.0	79	38
Cienfuegos, Cuba	T.	......	62	67	70	69	76	78	80	72	65	56	48	45	35	12	......	232.3	368.0	63	58
Havana, Cuba	T.	......	55	57	62	82	82	85	87	87	83	79	74	58	36	4	......	265.3	368.5	72	47
Kingston, Jamaica, W. I	T.	......	52	52	59	82	80	83	82	79	67	55	39	20	23	10	......	219.2	367.2	60	36
Port of Spain, Trinidad, W. I	T.	......	33	33	56	69	73	76	63	64	65	58	55	50	8	8	......	202.8	365.6	55	30
Puerto Principe, Cuba	T.	......	48	56	71	71	73	74	70	66	55	44	29	26	24	0	......	200.7	367.8	55	48
Roseau, Dominica, W. I	T.	......	24	23	45	71	75	87	83	87	92	90	88	67	39	53	......	256.0	366.6	70	41
San Juan, Porto Rico	T	......	8	24	48	73	83	82	80	74	67	59	50	23	11	5	......	203.3	367.2	55	50
Santiago de Cuba, Cuba	T.	......	69	71	67	66	66	78	69	75	74	70	46	39	39	8	......	232.1	367.6	63	43
Santo Domingo, Santo Domingo	T.	......	52	58	56	63	75	77	77	70	63	61	43	26	22	5	......	209.3	367.2	57	54
Willemstad, Curaçao	T.	......	13	13	32	57	67	77	89	85	87	87	84	77	53	57	......	243.4	365.7	67	55

*No record.

TABLE IX.—*Accumulated amounts of precipitation for each 5 minutes, for storms in which the rate of fall equaled or exceeded* 0.25 *in any* 5 *minutes, or* 0.75 *in* 1 *hour during September,* 1900, *at all stations furnished with self-registering gages.*

Stations.	Date.	Total duration. From—	Total duration. To—	Total am't of precipitation.	Excessive rate. Began—	Excessive rate. Ended—	Amount before excessive began.	5 min.	10 min.	15 min.	20 min.	25 min.	30 min.	35 min.	40 min.	45 min.	50 min.	60 min.	80 min.	100 min.	120 min.
	1	2	3	4	5	6	7														
Albany, N. Y.	21			0.15								0.15									
Alpena, Mich.	2			0.65														0.40			
Atlanta, Ga.	14-15			3.51														0.53			
Atlantic City, N. J.	15-16			0.93														0.37			
Baltimore, Md.	15-16	1.20 p.m.	D. N.	3.61	10.45 p.m.	11.30 p.m.	1.87	0.18	0.60	0.86	1.02	1.18	1.32	1.46	1.49	1.55	1.58	1.61			
Binghamton, N. Y.	6	3.11 p.m.	8.50 p.m.	1.47	5.52 p.m.	6.30 p.m.	0.53	0.12	0.22	0.40	0.56	0.63	0.66	0.75	0.87						
Bismarck, N. Dak.	14			0.72														0.50			
Boise, Idaho	5			0.89														0.31			
Boston, Mass.	17-18			2.40														0.60			
Buffalo, N. Y.	20			0.68														0.39			
Cairo, Ill.	19-20			1.30														0.61			
Cedar City, Utah	24			0.54														*			
Charleston, S. C.	13			0.66														0.60			
Chicago, Ill.	15			0.29														0.28			
Cincinnati, Ohio	20			0.19														0.10			
Cleveland, Ohio	3	1.46 p.m.	2.30 p.m.	0.62	2.00 p.m.	2.20 p.m.	0.02	0.09	0.18	0.33	0.56	0.57									
Columbia, Mo.	2			0.66														0.64			
Columbus, Ohio	29			0.56														0.35			
Denver, Colo.	25-26			0.58														0.20			
Des Moines, Iowa	24			1.08														0.34			
Detroit, Mich.	29			1.12														0.38			
Dodge, Kans	12	3.45 a.m.	4.30 a.m.	0.69	3.45 a.m.	4.20 a.m.	0.00	0.05	0.15	0.32	0.45	0.52	0.61	0.67							
Duluth, Minn.	5	2 40 a.m.	4.35 a.m.	0.79	3.47 a.m.	4.15 a.m.	0.08	0.10	0.22	0.32	0.41	0.60	0.69								
Eastport, Me.	16			0.58														0.10			
Elkins, W. Va	27	3.50 p.m.	5.45 p.m.	0.62	4.45 p.m.	5.20 p.m.	0.03	0.18	0.32	0.40	0.44	0.48	0.52	0.58							
Erie, Pa.	27			0.45														0.39			
Escanaba, Mich.	11	1.40 p.m.	10.30 p.m.	1.59	1.45 p.m.	2.05 p.m.	T.	0.15	0.31	0.49	0.56	0.58	0.58	0.59	0.63	0.77	0.85	0.90			
Evansville, Ind	2	6.00 p.m.	9.10 p.m.	2.38	6.00 p.m.	7.00 p.m.	0.00	0.08	0.17	0.26	0.43	0.69	1.01	1.29	1.50	1.65	1.86	2.20			
Fort Worth, Tex	21	2.40 a.m.	11.55 a.m.	6.30	2.55 a.m.	3.40 a.m.	0.09	0.10	0.19	0.22	0.29	0.54	0.82	0.88	0.95	1.06					
					4.35 a.m.	5.25 a.m.	1.20	0.15	0.42	0.79	1.07	1.34	1.80	2.17	2.40	2.63	2.81				
					5.25 a.m.	6.15 a.m.		2.97	3.08	3.23	3.39	3.56	3.66	3.74	3.81	3.91	3.95				
					6.15 a.m.	7.00 a.m.		4.02	4.11	4.22	4.32	4.41	4.49	4.53	4.57	4.61	4.63	4.66			
Fresno, Cal.	3			0.11														0.04			
Galveston, Tex.	4	3.46 a.m.	5.42 a.m.	0.70	5.14 a.m.	5.25 a.m.	0.15	0.37	0.51	0.53	0.54										
Grand Junction, Colo.	24			0.43														*			
Harrisburg, Pa	3	7.40 p.m.	9.10 p.m.	0.80	8.15 p.m.	8.50 p.m.	0.02	0.18	0.39	0.47	0.54	0.63	0.70	0.77	0.78						
Hatteras, N. C.	23			0.32									0.32								
Huron, S. Dak.	7-8	6.25 p.m.	2.10 a.m.	1.54	10.00 p.m.	10.55 p.m.	0.23	0.18	0.26	0.29	0.30	0.31	0.32	0.43	0.53	0.61	0.82	0.90			
Indianapolis, Ind.	27			0.47										0.47							
Jacksonville, Fla.	4			1.10														0.61			
Jupiter, Fla.	5-6	11.15 a.m.	10.00 a.m.	4.35	1.35 a.m.	2.25 a.m.	2.09	0.05	0.17	0.29	0.45	0.53	0.61	0.68	0.76	0.84	0.90	1.00			
Kalispell, Mont	7-8			0.56														0.35			
Kansas City, Mo.	27	5.00 a.m.	9.40 p.m.	3.01	5.15 a.m.	6.00 a.m.	0.08	0.05	0.14	0.22	0.37	0.49	0.60	0.68	0.82	0.88					
					6.40 a.m.	8.15 a.m.	1.20	0.10	0.18	0.26	0.33	0.39	0.47	0.54	0.59	0.64	0.68	0.74	0.96	1.19	1.33
Key West, Fla.	10-11	8.20 p.m.	7.55 p.m.	3.73	4.45 a.m.	5.15 a.m.	0.45	0.11	0.39	0.59	0.71	0.78	0.84								
					8.05 a.m.	9.15 a.m.	1.40	0.10	0.20	0.26	0.34	0.39	0.42	0.46	0.52	0.64	0.72	1.00	1.19		
Do	16	2.04 p.m.	3.05 p.m.	0.90	2.10 p.m.	2.45 p.m.	T.	0.05	0.21	0.49	0.52	0.62	0.75	0.84	0.88						
Knoxville, Tenn	21	3.50 p.m.	5.45 p.m.	0.67	4.17 p.m.	4.25 p.m.	T	0.46	0.55	0.56	0.57										
Lexington, Ky.	27	4.55 p.m.	6.00 p.m.	0.70	5.00 p.m.	5.15 p.m.	T.	0.21	0.40	0.48	0.52	0.53	0.54	0.56	0.66	0.69	0.70				
Lincoln, Nebr.	10 11			1.58														0.50			
Little Rock, Ark.	20			1.26														0.65			
Los Angeles, Cal.	2			T.																	
Louisville, Ky.	29			0.66														0.29			
Macon, Ga.	15			0.58														0.30			
Memphis, Tenn.	19-20			1.70														0.68			
Meridian, Miss.	13-14			2 41														0.34			
Milwaukee, Wis.	2	7.20 p.m.	9.45 p.m.	2.04	8.25 p.m.	9.20 p.m.	0.13	0.09	0.16	0.42	0.77	0.97	1.17	1.52	1.67	1.76	1.82	1.90			
Montgomery, Ala	14	8.10 a.m.	7.30 p.m.	3.43	5.00 a.m.	5.25 a.m.	0.30	0.05	0.12	0.32	0.60	0.98	0.99								
					4.25 p.m.	5.15 p.m.	2.35	0.05	0.16	0.28	0.49	0.57	0.64	0.73	0.82	0.88	0.92	0.95			
Nantucket, Mass.	16			2.42														0.70			
Nashville, Tenn.	1	6.46 p.m.	11.00 p.m.	2.88	6.46 p.m.	8.20 p.m.	0.00	0.08	0.33	0.66	0.93	1.20	1.38	1.58	1 70	1.74	1.77	1.81	2.18	2.61	
New Haven, Conn.	16			0 43														0.48			
New Orleans, La.	7-8			1.80														0.64			
New York, N. Y.	15-16			1.66														0.28			
Norfolk, Va.	16			0.60														0.33			
Northfield, Vt.	27			0 57														0.56			
Oklahoma, Okla.	3			0.75														0.56			
Omaha, Nebr	22			1.02														0.61			
Parkersburg, W. Va.	15			0.40														0.14			
Philadelphia, Pa	15-16	4.10 p.m.	4.30 a.m.	3.87	2.05 a.m.	2.55 a.m.	1.09	0.07	0.14	0.20	0.32	0.48	0.69	0.78	0.91	1.08	1.15				
					2 55 a.m.	3.30 a.m.		1.20	1.30	1.60	1.88	2.12	2.47	2.71	2 74	2.78	2.79				
Do	30	D. N.	7.10 p.m.	2.39	11.00 a.m.	11.55 a.m.	0.29	0.03	0.10	0.19	0.31	0.42	0.50	0.61	0.72	0.78	0.87	0.98	1.04	1.13	1.24
Pittsburg, Pa.	29			0.26														0.21			
Pocatello, Idaho	17			0.04														0.04			
Portland, Me.	22			0.34								0.34									
Portland, Oreg.	19			0.67														0.26			
Pueblo, Colo	27			0.08														0.06			
Raleigh, N. C.	15-16	10.00 p.m.	D. N.	1.68	10.25 p.m.	11.10 p.m.	0.04	0.10	0.17	0.22	0.26	0.38	0.50	0.62	0.66	0.72	0.73	0.81	0.91		
Richmond, Va.	15-16	10.57 p.m.	D. N.	0.70	11.20 p.m.	11.35 p.m.	T.	0.23	0.43	0.53	0.54	0.60	0.62								
Rochester, N. Y.	20			0.65														0.13			
St. Louis, Mo.	28-29	5.05 p.m.	3.05 a.m.	0.95	7.08 p.m.	7.25 p.m.	0.20	0.05	0.19	0.44	0.51	0.54	0.57	0.59	0.61						
St. Paul, Minn.	10-11	11.20 p.m.	2.35 p.m.	4 17	12 35 a.m.	2.30 a.m.	0.20	0.05	0.15	0.21	0.30	0.42	0.53	0.58	0.64	0.70	0.77	0.93	1.06	1.16	1.39
Do	22	10 28 a.m.	12.18 p.m.	0.43	10.28 a.m.	10.38 a.m.	0.00	0.27	0.42												
Salt Lake City, Utah.	23-24			1.27														0.18			
San Diego, Cal.	1			T.																	
Sandusky, Ohio	29			0.76														0.29			
San Francisco, Cal.	11-12			0.45														0.19			
Savannah, Ga.	1	12.55 p.m.	6.35 p.m.	1.23	1.45 p.m.	2.15 p.m.	0.35	0.05	0.27	0.39	0.50	0.56	0.60	0.64							
Do	13	1.06 p.m.	5.05 p.m.	0.85	1.18 p.m.	1.40 p.m.	T.	0.20	0.51	0.67	0.73										
Seattle, Wash.	22			0.38														0.24			
Spokane, Wash.	7			0.73														0.20			
Tampa, Fla.	30	6.59 p.m.	7.22 p.m.	0.78	7.00 p.m.	7.18 p.m.	T.	0.23	0.50	0.68	0.77										
Toledo, Ohio	20			0.33											0.33						
Topeka, Kans.	23-24	9.10 p.m.	8.15 a.m.	2.20	10.25 p.m.	11.05 p.m.	0.22	0.25	0.38	0.50	0.58	0.69	0.73	0.82	0.88	0.90					
Vicksburg, Miss.	20	12.55 p.m.	7.35 p.m.	1.94	3.05 p.m.	3.40 p.m.	0.02	0.06	0.16	0.28	0.40	0.53	0.78	0.88							
Washington, D. C.	15-16	12.05 p.m.	1.35 a.m.	2.95	9.20 p.m.	10.50 p.m.	1.50	0.05	0.11	0.17	0.23	0.27	0.31	0.36	0.40	0.45	0.50	0.70	1.18	1.22	
Wilmington, N. C.	16			0.73														0.43			
Yankton, S. Dak	10-11	8.20 p.m.	7.45 a.m.	2.29	3.40 p.m.	4.00 p.m.	0.05	0.18	0.45	0.75	0.83	0.83	0.90								

TABLE IX.—*Accumulated amounts of precipitation for each 5 minutes, etc.*—Continued.

Stations.	Date.	Total duration.		Total am't of precipitation.	Excessive rate.		Amount before excessive began.	Depths of precipitation (in inches) during periods of time as indicated.													
		From—	To—		Began—	Ended—		5 min.	10 min.	15 min.	20 min.	25 min.	30 min.	35 min.	40 min.	45 min.	50 min.	60 min.	80 min.	100 min.	120 min.
	1	2	3	4	5	6	7														
Basseterre, St. Kitts..	27	12.20 p.m.	2.40 p.m.	1.96	12.50 p.m..	1.40 p.m..	0.16	0.10	0.17	0.30	0.55	0.72	0.90	1.03	1.18	1.24	1.29	1.32	.....	.....	.....
Bridgetown, Barbados	1	4.40 a.m.	8.10 a.m.	1.08	4.40 a.m..	5.05 a.m..	0.00	0.07	0.24	0.50	0.62	0.68	0.71	.....	.....	.....	.....	.....	.....	.....	.....
Do	1	11.55 a.m.	8.30 p.m.	2.05	12.10 p.m..	12.45 p.m..	T.	0.08	0.18	0.28	0.41	0.47	0.52	0.59	.....	.....	.....	.....	.....	.....	.....
					5.14 p.m..	5.30 p.m.	1.25	0.20	0.47	0.57	0.62	0.63	.....	.....	.....	.....	.....	.....	.....	.....	.....
Cienfuegos, Cuba	2	1.35 p.m.	3.20 p.m.	0.93	1.37 p.m..	2.15 p.m..	T.	0.12	0.36	0.56	0.68	0.70	0.73	0.81	0.87	.....	.....	.....	.....	.....	.....
Do	4-5	3.50 p.m.	3.25 p.m.	3.90	5.55 a.m..	6.35 a.m..	1.09	0.25	0.43	0.60	0.74	0.83	1.00	1.11	1.17	.....	.....	.....	.....	.....	.....
Do	21	5.53 p.m.	6.30 p.m.	0.82	5.54 p.m..	6.20 p.m..	T.	0.10	0.26	0.48	0.64	0.78	0.82	.....	.....	.....	.....	.....	.....	.....	.....
Havana, Cuba	30	2.07 a.m.	3.25 a.m.	0.72	2.10 a.m..	2.30 a.m..	0.01	0.20	0.38	0.54	0.61	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Kingston, Jamaica....	6-7	8.20 p.m.	11.55 a.m.	5.23	3.35 a.m..	4.25 a.m..	0.52	0.09	0.17	0.19	0.21	0.36	0.38	0.47	0.58	0.72	0.85	.....	.....	.....	.....
					4.25 a.m..	5.15 a.m.	.....	0.93	1.09	1.25	1.47	1.61	1.77	1.92	2.00	2.19	2.56	.....	.....	.....	.....
					5.15 a.m..	6.05 a.m..	.....	2.80	2.92	3.05	3.14	3.18	3.21	3.24	3.30	3.34	3.37	.....	.....	.....	.....
					6.05 a.m..	6.45 a.m..	.....	3.42	3.47	3.52	3.64	3.77	3.90	3.99	4.04	4.06	4.07	.....	.....	.....	.....
Port of Spain, Trin....	26	.....	.....	1.45	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	0.75	.....	.....	.....
Puerto Principe, Cuba	4-5	3.30 a.m.	D. N	3.39	2.45 p.m..	3.03 p.m..	1.85	0.20	0.50	0.75	0.80	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Do	8	2.37 p.m.	8.50 p.m.	2.76	3.00 p.m..	3.45 p.m..	0.03	0.16	0.47	0.66	0.96	1.15	1.33	1.52	1.75	1.81	1.84	1.87	.....	.....	.....
Do	16	3.22 p.m.	5.15 p.m.	1.49	3.27 p.m..	3.57 p.m..	0.05	0.25	0.47	0.62	0.83	1.09	1.21	.....	.....	.....	.....	.....	.....	.....	.....
Roseau, Dominica	13	.....	.....	0.73	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	0.60	.....	.....	.....
San Juan, Porto Rico..	27	12.50 p.m.	3.20 p.m.	0.77	1.35 p.m..	2.20 p.m..	0.02	0.08	0.25	0.38	0.45	0.50	0.54	0.63	0.68	0.72	0.74	0.75	.....	.....	.....
Santiago de Cuba	3-4	7.15 a.m.	3.50 p.m.	18.08	9.43 a.m.†	10.45 a.m.†	0.41	0.41	0.74	0.92	1.06	1.12	1.39	1.82	2.24	2.29	2.38	2.59	.....	.....	.....
					11.05 a.m.†	12.10 p.m.†	3.14	0.29	0.51	0.58	0.63	0.86	0.92	0.98	1.13	1.26	1.34	1.54	.....	.....	.....
					12.45 p.m.†	2.05 p.m.†	5.02	0.16	0.42	0.66	0.77	0.87	0.99	1.07	1.12	1.16	1.21	1.31	1.65	.....	.....
					3.15 p.m.†	4.30 p.m.†	6.89	0.14	0.54	0.86	1.16	1.40	1.75	1.98	2.24	2.52	2.74	3.15	3.51	.....	.....
					11.05 p.m.†	11.50 p.m.†	10.99	0.06	0.27	0.32	0.50	0.59	0.78	0.87	0.98	1.06	1.09	1.11	.....	.....	.....
					7.45 a.m.‡	9.30 a.m.‡	12.51	0.08	0.18	0.36	0.50	0.65	0.80	0.93	1.00	1.16	1.27	1.30	1.72	1.96	2.16
					11.30 a.m.‡	12.10 p.m.‡	15.79	0.08	0.12	0.15	0.19	0.37	0.67	0.90	1.09	1.11	1.14	1.23	.....	.....	.....
Santo Domingo, S. D..	25	12.30 p.m.	2.40 p.m.	1.10	12.35 p.m..	1.15 p.m..	T.	0.11	0.28	0.31	0.43	0.61	0.77	0.91	1.00	1.03	.....	.....	.....	.....	.....
Willemstad, Curaçao .	23	3.40 a.m.	7.34 a.m.	1.98	5.55 a.m..	6.35 a.m..	0.90	0.10	0.26	0.33	0.44	0.52	0.73	0.95	1.03	1.06	.....	.....	.....	.....	.....

*Self register not working. † September 3. ‡ September 4.

TABLE X.—*Data furnished by the Canadian Meteorological Service, September, 1900.*

Stations.	Pressure.			Temperature.				Precipitation.		
	Mean not reduced.	Mean reduced.	Departure from normal.	Mean.	Departure from normal.	Mean maximum.	Mean minimum.	Total.	Departure from normal.	Depth of snow.
	Ins.	*Ins.*	*Ins.*	°	°	°	°	*Ins.*	*Ins.*	*Ins.*
St. Johns, N. F	29.80	29.94	—.06	52.4	— 1.6	60.1	44.7	5.82	+1.73	
Sydney, C. B. I	29.99	30.03	.00	56.3	— 0.2	66.0	46.7	4.08	+0.84	
Halifax, N. S	29.94	30.05	.00	60.0	+ 2.4	68.8	51.1	5.04	+1.49	
Grand Manan, N. B	29.99	30.04	.00	58.4	+ 2.3	65.3	51.5	2.96	+1.16	
Yarmouth, N. S	29.98	30.06	—.01	56.2	+ 0.1	64 1	48.4	5.16	+2.57	
Charlottet'n, P. E. I	29.96	30.00	—.02	58.3	+ 1.0	66.3	50.3	5.04	+2.18	
Chatham, N. B	29.98	30.00	—.01	57.0	+ 1.6	67.1	46.8	2.62	—0.10	
Father Point, Que	29.97	30.00	+.01	49.6	— 0.8	58.4	40.7	5.08	+2.28	
Quebec, Que	29.72	30.04	+.02	56.3	+ 1.2	64.2	48.5	4.30	+0.63	
Montreal, Que	29.84	30.04	+.01	60.2	+ 1.8	67.1	53.4	3.62	+0.40	
Bissett, Ont	29.46	30.06	+.03	56.6	+ 2.9	69.0	44.1	4.34	+0.64	
Ottawa, Ont	29.71	30.02	—.01	60.7	+ 3.3	69.8	51.6	3.56	....	
Kingston, Ont	29.74	30.05	+.01	62.8	+ 2.8	71.2	54.4	4.13	+1.36	
Toronto, Ont	29.69	30.07	+.01	64.7	+ 5.7	74.3	55.1	1.43	—1.32	
White River, Ont	28.68	30.01	+.01	53.1	+ 2.8	63.6	42.6	3.27	+0.19	
Port Stanley, Ont	29.44	30.07	+.03	63.6	+ 4.1	73.3	53.9	1.97	—0.68	
Saugeen, Ont	29.36	30.06	+.02	62.3	+ 4.8	71.7	52.8	1.76	—1.75	
Parry Sound, Ont	29.35	30.03	.00	61.7	+ 5.7	71.6	51.7	4.54	+0.21	....
Port Arthur, Ont	29.25	29.94	—.03	54.7	+ 2.5	63.5	45.9	6.14	+2.67	....
Winnipeg, Man	29.16	29.98	+.05	53.6	+ 1.1	63.6	43.6	4.22	+2.22	....
Minnedosa, Man	28.16	29.95	+.02	52.0	+ 1.5	62.7	41.3	4.16	+2.74	0.1
Qu'Appelle, Assin	27.71	29.95	+.02	50.7	+ 0.4	61.3	40.1	2.63	+1.49	5.0
Medicine Hat, Assin.	27.71	29.97	—.02	53.4	+ 1.6	65 6	41.2	1.67	+0.82	2.5
Swift Current, Assin.	27.46	30.01	+.06	51.4	+ 2.3	62.2	40.6	2.48	+1 35	0.8
Calgary, Alberta	26.44	29.95	+.04	47.8	+ 2.0	59.4	36.1	3.99	+2.09	6.0
Banff, Alberta	25.39	30.03	......	44 9	— 0.9	55.4	34.5	2.00	+0.52	0.5
Edmonton, Alberta	27.67	29.96	+.05	48.3	+ 1.0	59.7	36.9	3.16	+1.67	2.2
Prince Albert, Sask	28.40	29.93	......	49.3	+ 0.9	60.9	37.7	1.94	+0.86	0.6
Battleford, Sask	28.27	29.97	......	50.2	— 1.6	62.0	38.5	1.21	—0.07	....
Kamloops, B. C	28.76	30.02	. ...	57.1	— 0.3	67.9	46.3	0.56	—0.47	....
Victoria, B. C	29.93	30.02	......	55.8	......	62.9	48.6	1.15	......	....
Barkerville, N. W. T.	25.71	29.99	......	46.2	— 0.5	58.1	34.4	1.90	—0.96	1.0
Hamilton, Bermuda.	29.89	30.05	+.01	76.8	— 0.6	82.2	71.4	8.32	+2.84	....

TABLE XI.—*Heights of rivers referred to zeros of gages, September*, 1900.

Stations.	Distance to mouth of river.	Danger line on gage.	Highest water.		Lowest water.		Mean stage.	Monthly range.
			Height.	Date.	Height.	Date.		
	Miles.	Feet.	Feet.		Feet.		Feet.	Feet.
Mississippi River.								
St. Paul, Minn	1,954	14	6.0	25-28	3.9	9	5.2	2.1
Reeds Landing, Minn	1,884	12	7.3	16, 17	3.8	11	5.3	3.5
La Crosse, Wis	1,819	12	8.8	20	5.3	11	6.8	3.5
Prairie du Chien	1,759	18	8.7	25, 26	5.0	11, 12	6 4	3.7
Dubuque, Iowa	1,699	15	8 3	26-29	4.6	1	6.0	3.7
Leclaire, Iowa	1,609	10	5.2	26-30	2.5	3-12	3 4	2.7
Davenport, Iowa	1,593	15	6.4	27-30	3.6	1, 2	4 5	2.8
Muscatine, Iowa	1,562	16	7.7	28-30	4.8	1	5.7	2.9
Galland, Iowa	1,472	8	3.8	30	2.0	17, 18	2.5	1.8
Keokuk, Iowa	1,463	15	6.6	30	3.2	18	4.1	3.4
Hannibal, Mo	1,402	13	7.6	30	4.2	12,13,15-19	5 0	3.4
Grafton, Ill	1,306	23	8.2	30	5 6	18, 19	6 5	2 6
St. Louis, Mo	1,264	30	10.4	6	6 0	19	8.1	4.4
Chester, Ill	1,189	36	7.5	7	4.0	19	5.7	3 5
Memphis, Tenn	843	33	5.4	7, 8	1.9	25	3.6	3.5
Helena, Ark	707	42	9.7	9	4.8	25, 26	7.3	4 9
Arkansas City, Ark	635	42	10.4	11, 12	5.0	25, 26	8.0	5.4
Greenville, Miss	595	42	8.4	11, 12	4.4	27	6.6	4 0
Vicksburg, Miss	474	45	7.3	13, 14	2.4	28	5.3	4 9
New Orleans, La	108	16	6.8	8	3.4	25	4.3	3.4
Missouri River.								
Bismarck, N. Dak.	1,309	14	2.9	16	1.0	5	1.5	1.9
Pierre, S. Dak.	1,114	14	3.4	19-21	1.9	5, 11	2.6	1.5
Sioux City, Iowa	784	19	6.2	1	4 8	9, 10	5.6	1.4
Omaha, Nebr	669	18	7.5	1	5 9	10, 11	6.7	1.6
St. Joseph, Mo	481	10	3.5	1	1.3	12	2 3	2.2
Kansas City, Mo	388	21	11.3	29	6.7	15	8.3	4.6
Boonville, Mo	199	20	9.2	3, 4	5.8	14-16	7.3	3.4
Hermann, Mo	103	24	8.9	5	5.2	18	6 6	3.7
Illinois River.								
Peoria, Ill	135	14	8.2	3, 4	5.3	25	6.7	2.9
Youghiogheny River.								
Confluence, Pa	50	10	0.2	1, 2	— 0.2	20-27	0.0	0.4
West Newton, Pa	15	23	0.1	1-4	— 0.1	12-29	0.0	0.2
Allegheny River.								
Warren, Pa	177	14	0.0	1, 2	— 0.3	15-30	—0.2	0.3
Oil City, Pa	123	13	0.8	1	— 0.1	29, 30	0.2	0.9
Parker, Pa	73	20	0.7	1, 2, 8, 9	— 0.4	29	0.1	1.1
Monongahela River.								
Weston, W. Va.	161	18	— 1.0	1	— 2.0	11-16	—1.7	1.0
Fairmont, W. Va	119	25	0.1	1, 2	— 0.6	19-30	—0.4	0.7
Greensboro, Pa	81	18	6.8	?	5.8	19-30	6.1	1.0
Lock No. 4, Pa	40	28	7.9	1	4.0	29, 30	5.8	3.9
Conemaugh River.								
Johnstown, Pa	64	7	1.8	1	0.4	22-25, 27, 29, 30	0.9	1.4
Red Bank Creek.								
Brookville, Pa	35	8	0.3	30	— 0.4	10-29	—0.3	0.7
Beaver River.								
Ellwood Junction, Pa	10	14	2.3	1, 4-7	0.5	29, 30	1.8	1.8
Great Kanawha River.								
Charleston, W. Va	61	30	7.7	18	6.0	12-16	6.5	1.7
Little Kanawha River.								
Glenville, W. Va	100	24	0.0	1-5	— 2.4	22	—1.7	2.4
New River.								
Hinton, W. Va	95	14	4.1	17	0.8	11-15	1.4	3.3
Cheat River.								
Rowlesburg, W. Va	36	14	1.2	1	— 1.2	22	—0.2	2.4
Ohio River.								
Pittsburg, Pa	966	22	6.1	10	5.1	17	5.7	1.0
Davis Island Dam, Pa	960	25	3.0	1	1.1	19-21	1.7	1.9
Wheeling, W. Va	875	36	3.0	1	0.3	23-26, 28, 29	1.1	2.7
Parkersburg, W. Va	785	36	4.8	1	1.2	27-29	2.4	3 6
Point Pleasant, W. Va	703	39	3.7	18	1.3	26, 27, 30	2.0	2.4
Huntington, W. Va	660	50	6 2	1	2.7	28	4 3	3 5
Catlettsburg, Ky	651	50	4.4	1	1.2	16	2.5	3.2
Portsmouth, Ohio	612	50	6.1	1	2.3	18, 27	3.5	3.8
Cincinnati, Ohio	499	50	7 7	1	3.5	19, 20	5.0	4.2
Madison, Ind	413	46	7.5	1	3.4	21	4.8	4.1
Louisville, Ky	367	28	4.7	1	2.1	21, 22	3.0	2.6
Evansville, Ind	184	35	5.9	1	1.5	25	3.4	4.4
Paducah, Ky	47	40	4.4	4, 5	1.6	19, 20	2.8	2.8
Cairo, Ill	1,073	45	11.4	5, 6	5.8	21, 22	8.4	5.6
Muskingum River.								
Zanesville, Ohio	70	20	7.6	6	5.8	19, 20, 23-27	6.4	1.8
Scioto River.								
Columbus, Ohio	110	17	2.3	1-4	1.9	25	2 1	0.4
Miami River.								
Dayton, Ohio	69	18	1.0	9, 17	0.6	15, 16, 22, 26, 27	0.8	0.4
Wabash River.								
Mount Carmel, Ill	50	15	3.2	6-8	1.6	21, 22	2.3	1.6
Licking River.								
Falmouth, Ky	30	25	1.2	1	0.4	14-29	0.5	0.8
Clinch River.								
Speers Ferry, Va	156	20	2.0	16	— 0.8	13	0.2	2.8
Clinton, Tenn	46	25	7.4	18	2.0	11, 12	4.0	5.4
Tennessee River.								
Knoxville, Tenn	614	29	3.6	18	0 0	13	0.9	3.6
Kingston, Tenn	534	25	3.3	19	0.7	22	1.5	2 6
Chattanooga, Tenn	430	33	4.7	20	1.0	13	2.4	3.7
Bridgeport, Ala	390	24	2.8	20	0.2	13, 14	1.1	2 6
Florence, Ala	220	16	2.5	22, 23	0.3	13-15	1.1	2.2
Riverton, Ala	190	25	2.8	23	— 1.3	15, 16	0.3	4 1
Johnsonville, Tenn	94	21	3.9	24, 25	0.6	17, 18	2.0	3.3
Cumberland River.								
Burnside, Ky	434	50	1.6	14, 23	— 0.2	13	0.5	1.8
Carthage, Tenn	257	40	2.0	24	0.2	13	1.1	1.8
Nashville, Tenn	175	40	3.3	24	1.0	13, 16	1.9	2.3
Arkansas River.								
Wichita, Kans	726	10	2.4	28	1.4	9	1.8	1.0
Webbers Falls, Ind. T.	413	23	9.2	30	*2.4	3-22	3.2	6 8
Fort Smith, Ark	351	22	8.8	30	1.8	12, 15-17	3.2	7.0
Dardanelle, Ark	256	21	4.5	30	0.8	17-19	2 0	3.7
Little Rock, Ark	176	23	4.2	28	1.8	18, 19	3.0	2.4
White River.								
Newport, Ark	150	26	4.4	3	2.0	15-17	3.0	2.4
Yazoo River.								
Yazoo City, Miss	80	25	1.6	30	0.0	25	0.6	1.6
Red River.								
Arthur City, Tex	688	27	12.0	28	4.9	7	7.6	7.1
Fulton, Ark	565	28	12.4	30	3.8	10	6.2	8.6
Shreveport, La	449	29	5.1	28	0.0	14, 15	1.7	5.1
Alexandria, La	139	33	1.6	30	— 1.2	20	—0.2	2.8
Ouachita River.								
Camden, Ark	340	39	15.3	25	3.3	19, 20	6.7	12.0
Monroe, La	100	40	8.4	29, 30	0.5	22-24	3.5	7.9
Atchafalaya River.								
Melville, La	100	31	9.8	10	5.7	29	7.9	4.1
Susquehanna River.								
Wilkesbarre, Pa	178	14	— 2.0	1-10	— 3.1	24-27	—2.4	1 1
Harrisburg, Pa	70	17	1.2	4	0.0	24-30	0.4	1.2
W. Br. of Susquehanna.								
Williamsport, Pa	35	20	0.8	1	0.1	16, 17, 23-30	0.3	0.7
Juniata River.								
Huntingdon, Pa	80	24	2.9	1-30	2.9	1-30	2.9	0.0
Potomac River.								
Harpers Ferry, W. Va	170	16	0.5	1, 2	0.0	26-30	0.3	0.5
James River.								
Lynchburg, Va	257	18	1.6	17	— 0.4	11-15	0.0	2 0
Richmond, Va.	110	12	1.6	17	— 1.2	2-4, 9	—0.8	2.8
Roanoke River.								
Weldon, N. C.	90	40	15.1	18	6.7	14-16	7.8	8.4
Cape Fear River.								
Fayetteville, N. C	100	38	10.4	17	0.3	13	2.2	10.1
Edisto River.								
Edisto, S. C	75	6	2.3	22-28	1.3	1, 11-15	1.8	1.0
Pedee River.								
Cheraw, S. C	145	27	8.2	18	0.4	13-15	1.3	7.8
Black River.								
Kingstree, S. C	60	12	— 0.2	1, 4-13	— 0.5	3	—0.3	0.3
Lynch Creek.								
Effingham, S. C	35	12	4.0	22	1.4	14	2.3	2.6
Santee River.								
St. Stephens, S. C	50	12	5.8	20, 21	— 1.1	15, 16	1.3	6.9
Congaree River.								
Columbia, S. C	37	15	2.0	17	— 0.6	14	0.3	2.6
Wateree River.								
Camden, S. C	45	24	7.4	18	1.5	29	2.8	5.9
Waccamaw River.								
Conway, S. C	40	7	1.9	1-3, 30	0.8	24	1.1	1.1
Savannah River.								
Calhoun Falls, S. C	347	......	6.9	16	2 0	13, 14, 28, 29	2.9	4.9
Augusta, Ga	268	32	15.6	17	5.3	14	7.3	10.3
Broad River.								
Carlton, Ga	30	......	5.5	15	2.0	12, 13	2.5	3.5
Flint River.								
Albany, Ga	80	20	4.6	17, 18	0.9	30	3.1	3.7
Chattahoochee River.								
Westpoint, Ga	239	20	12.6	16	2.2	13	10.4	10.4
Ocmulgee River.								
Macon, Ga	125	20	13.3	16	1.7	14	3.7	11.6
Oconee River.								
Dublin, Ga	60	30	6.0	19	— 0.3	13	1.2	6.3
Coosa River.								
Rome, Ga	225	30	11.1	16	0.8	10-14	2.1	10.3
Gadsden, Ala	144	18	10.7	17	0.0	13, 14	1.9	10.7
Alabama River.								
Montgomery, Ala	265	35	17.2	17	1.0	13	5.1	16.2
Selma, Ala	212	35	19.4	19	0.6	13	5.2	18.8
Tombigbee River.								
Columbus, Miss	303	33	— 0.6	5	— 3.1	20	—2.1	2.5
Demopolis, Ala.	155	35	5.9	18	0.2	28-30	5 7	5.7
Black Warrior River.								
Tuscaloosa, Ala	129	43	10.6	16	0.7	30	3.0	9.9
Brazos River.								
Kopperl, Tex.*	....	21	22.0	27	— 2.0	4, 5	6.0	24.0
Waco, Tex	....	22	22.8	28	0.3	6	7.4	22.5
Columbia River.								
Umatilla, Oreg	270	25	6.7	1	4.7	25, 26	5.5	2.0
The Dalles, Oreg	166	40	9.2	1	6.1	26	7.4	3.1
Willamette River.								
Albany, Oreg	99	20	1.0	13-19	0.6	29, 30	0.8	0.4
Portland, Oreg	10	15	4.4	9, 10	2.3	18, 19	3.3	2.1
Sacramento River.								
Red Bluff, Cal	241	23	1.3	6	— 0.5	18-30	—0.3	1.8
Sacramento, Cal	70	29	7.9	10-12	7.6	29, 30	7.8	0.3

*Record doubtful.

Chart I. Tracks of Centers of High Areas. September, 1900.

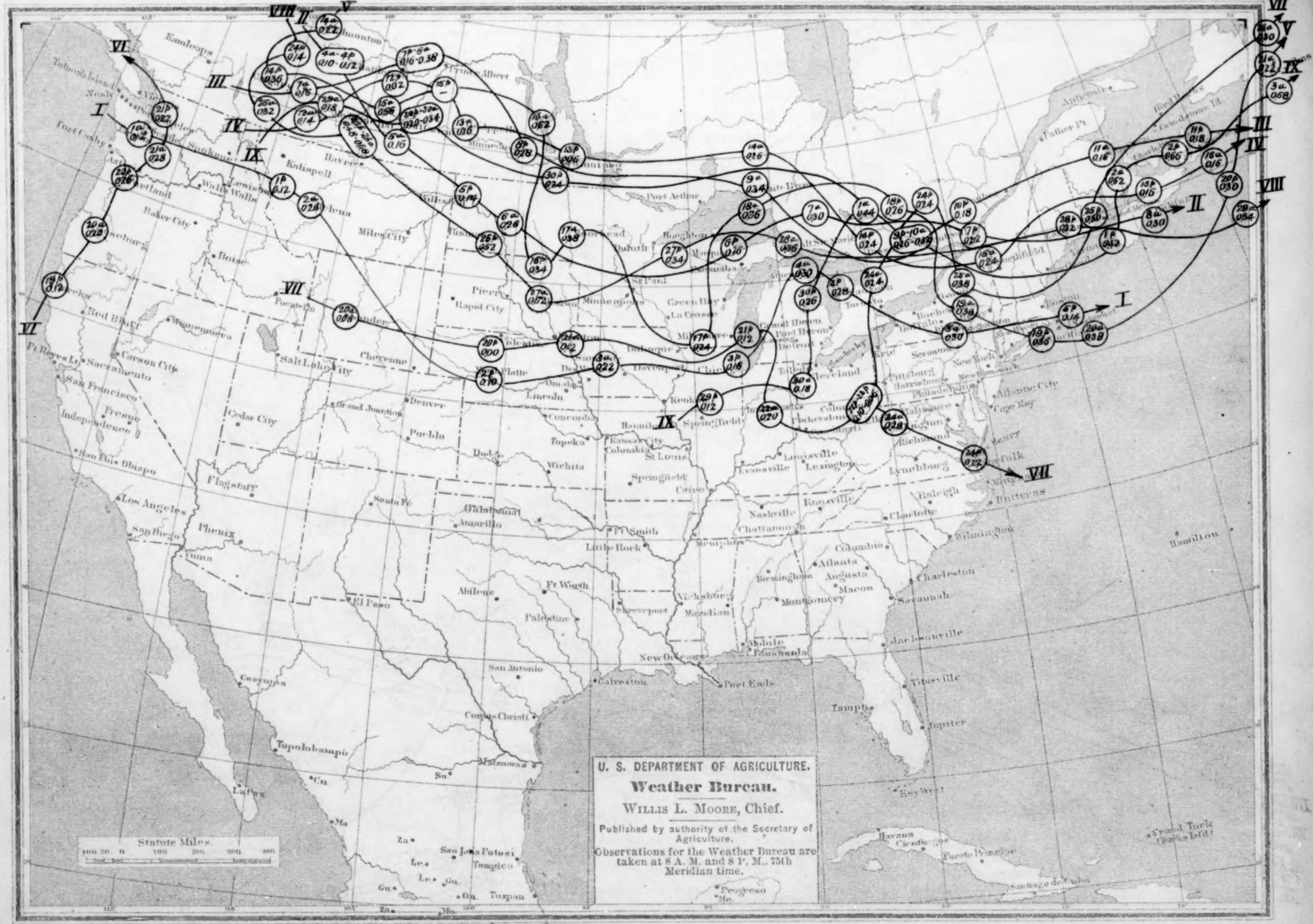

Chart II. Tracks of Centers of Low Areas. September, 1900.

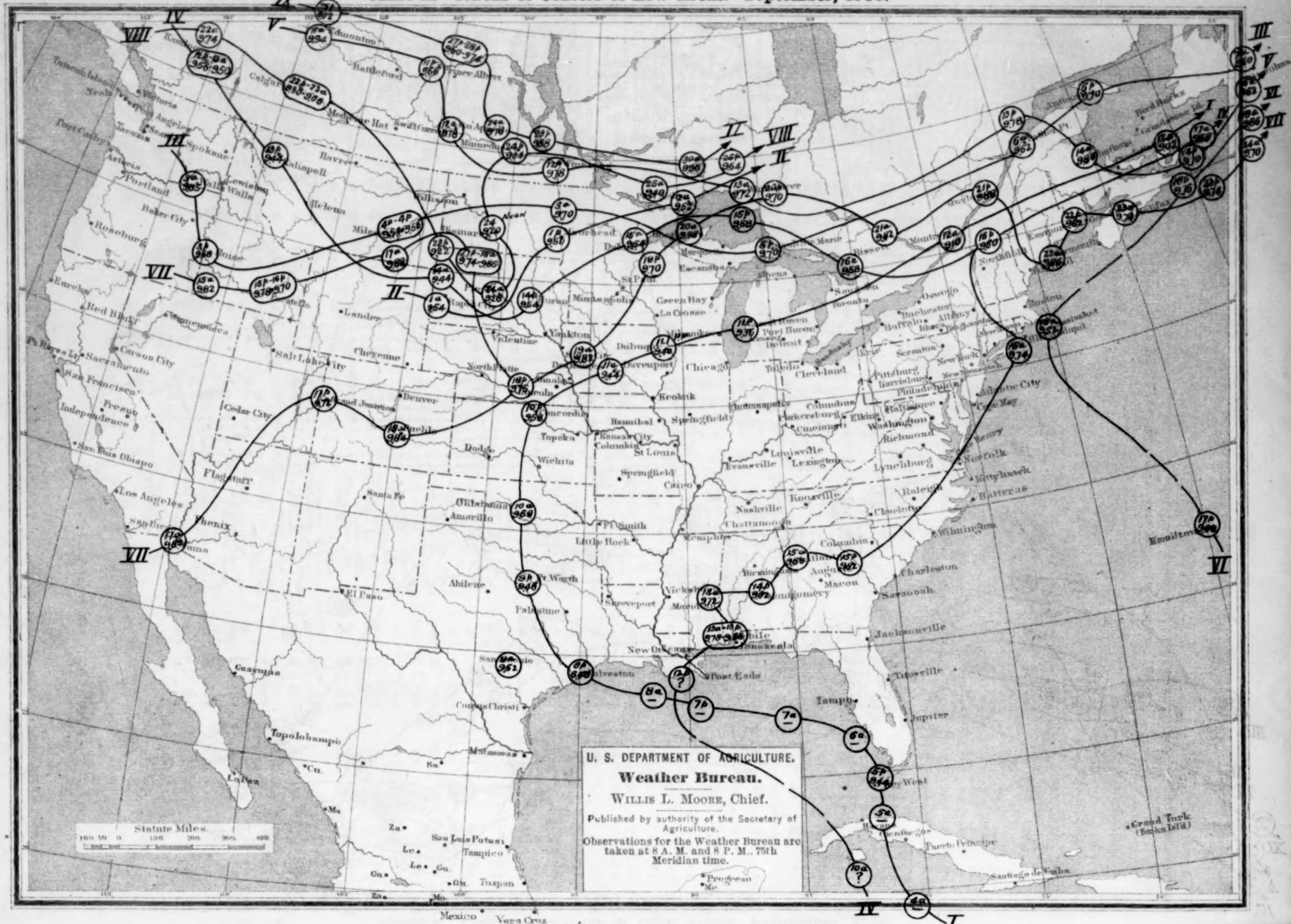

Chart III. Total Precipitation. September, 1900.

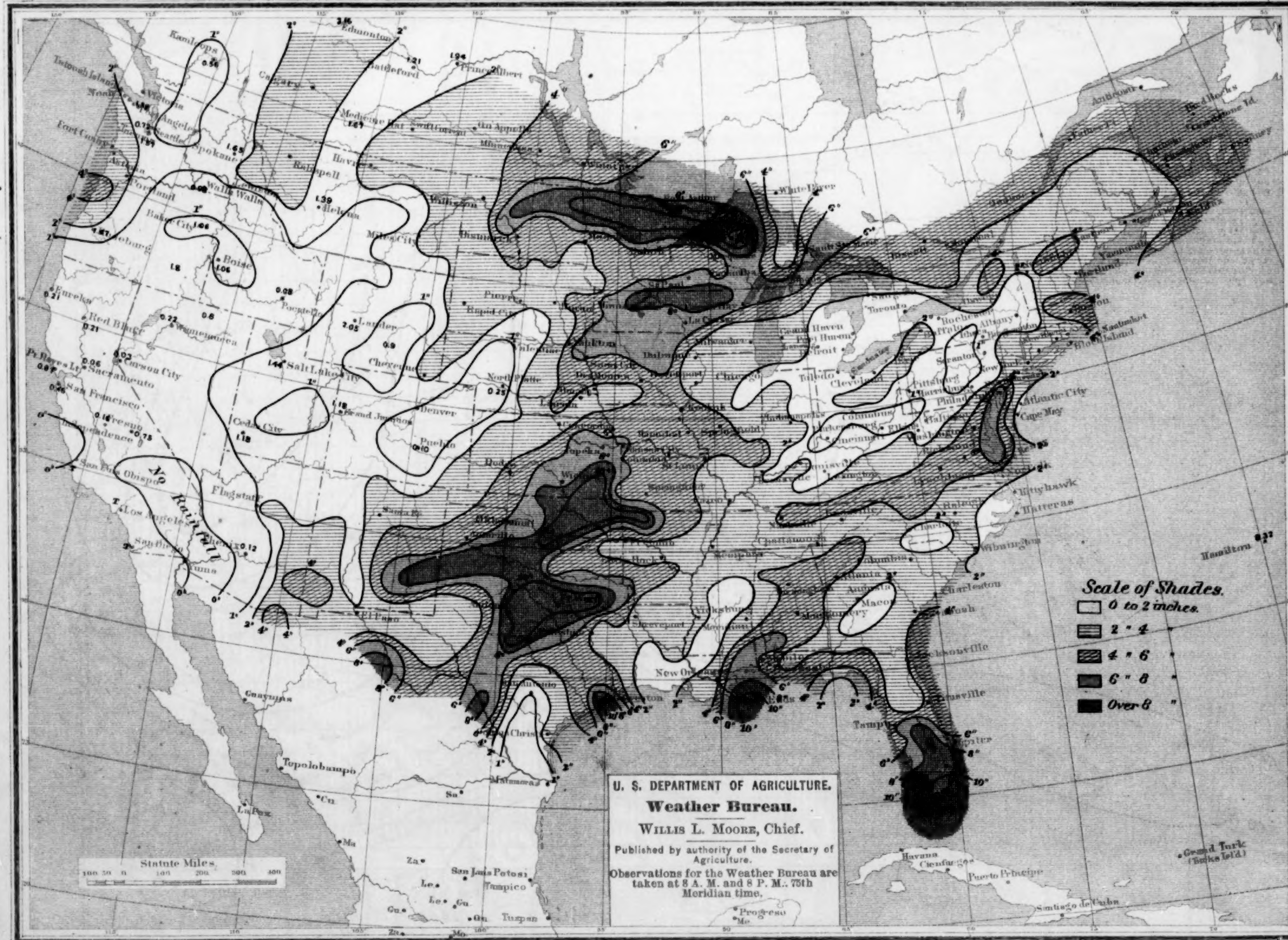

Chart IV. Sea-Level Pressure and Temperature; Resultant Surface Winds. September, 1900.

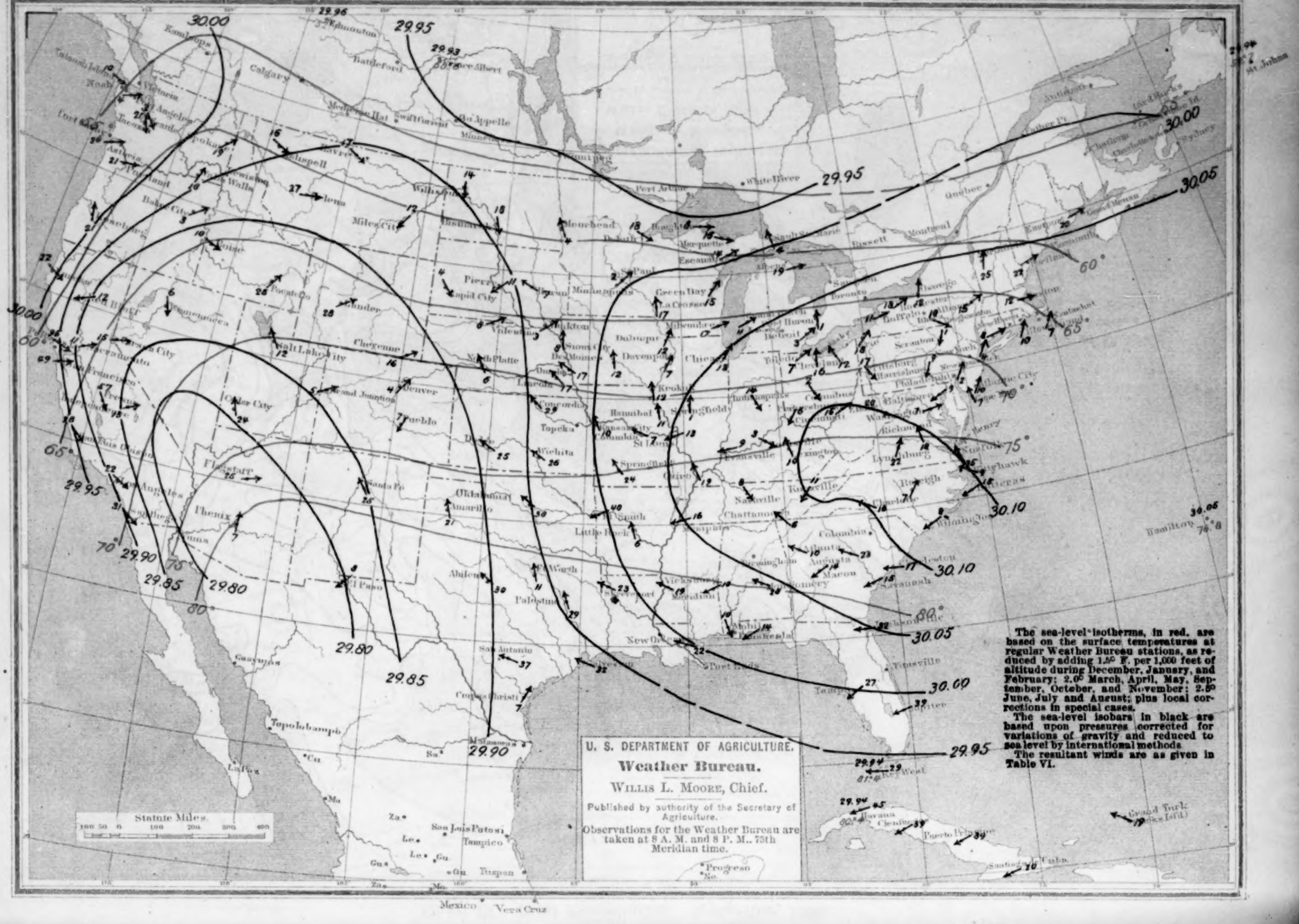

Chart V. Hydrographs for Seven Principal Rivers of the United States. September, 1900.

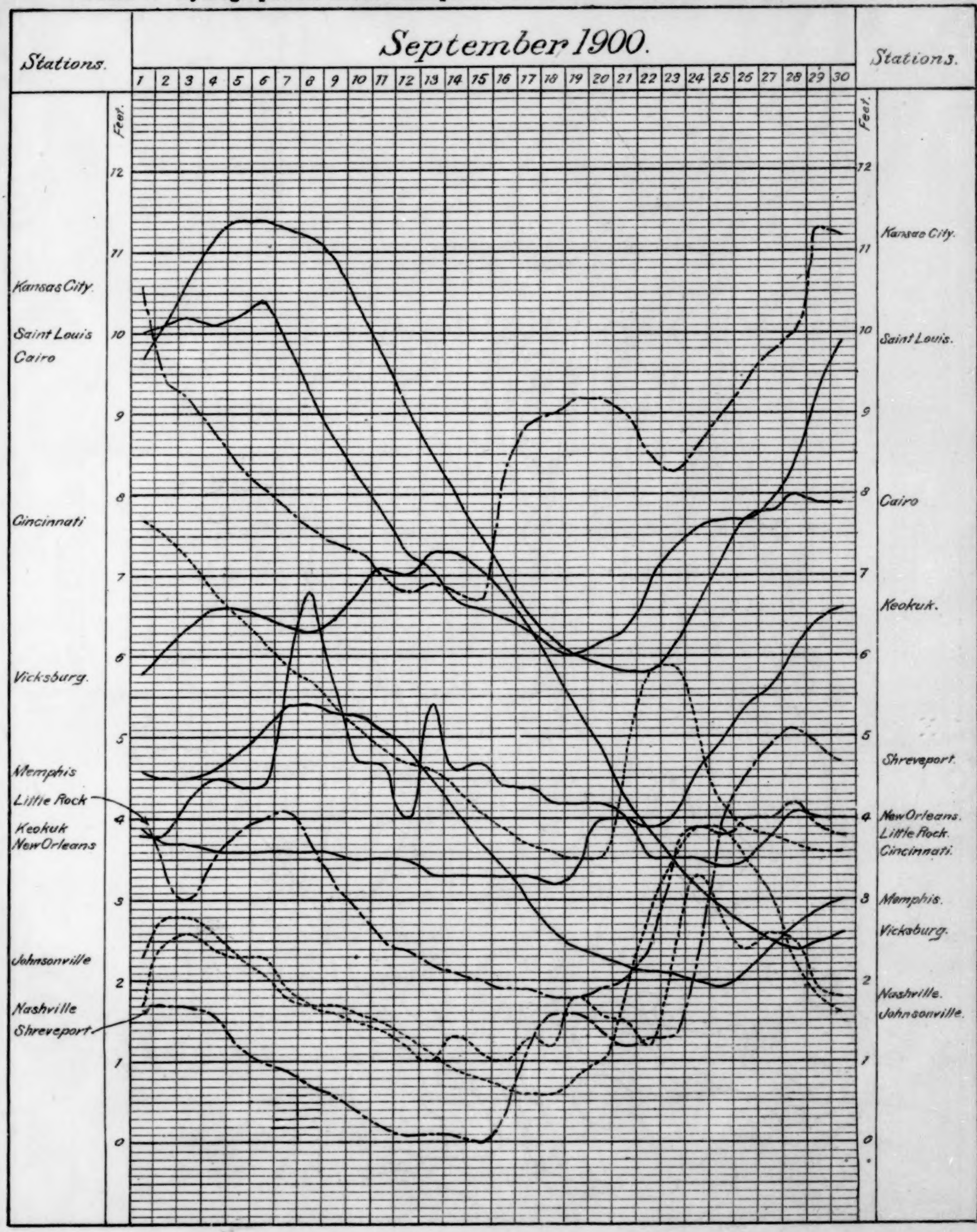

Chart VI. Surface Temperatures; Maximum, Minimum, and Mean. September, 1900.

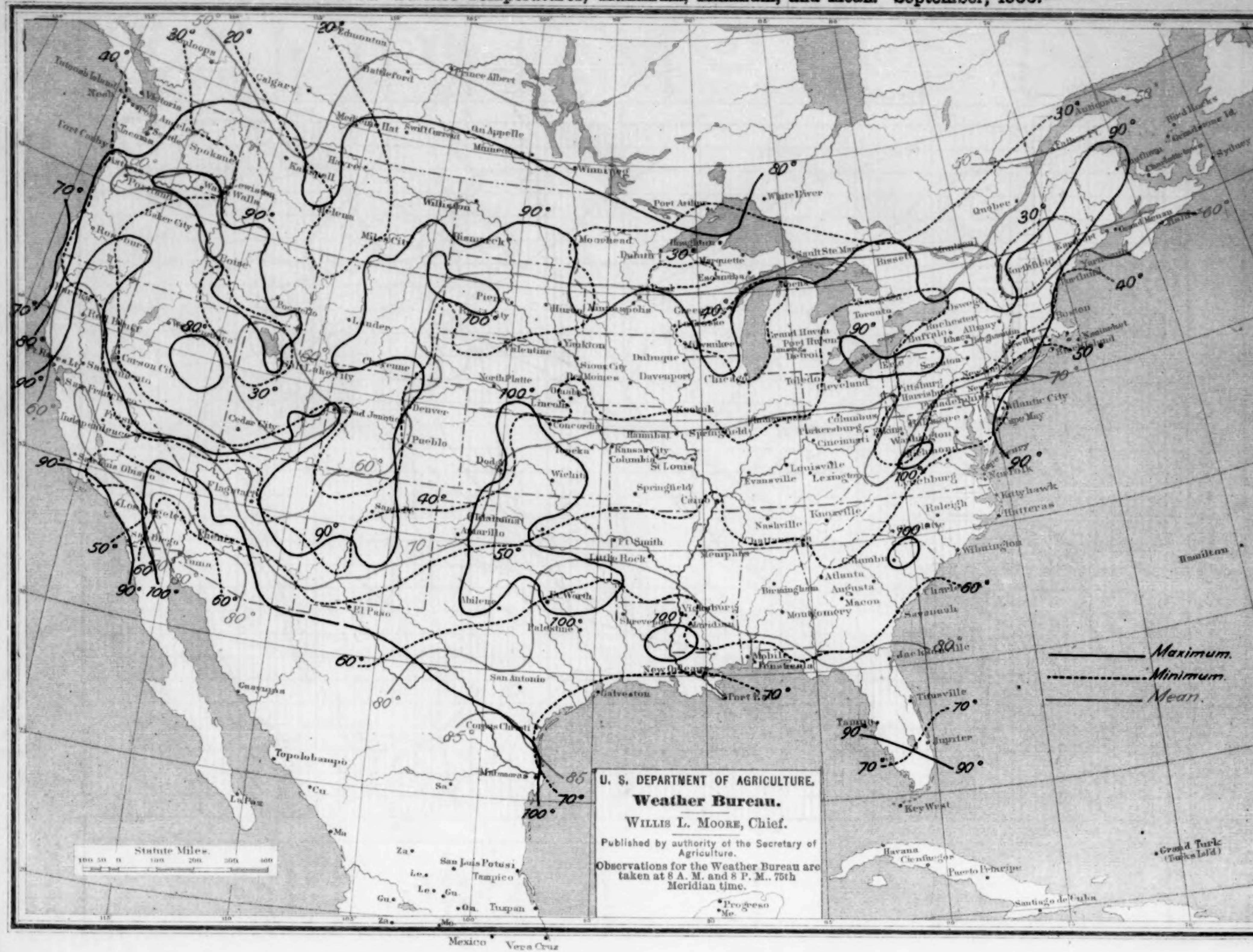

Chart VII. Percentage of Sunshine. September, 1900.

Chart VIII. West Indian Monthly Isobars, Isotherms, and Resultant Winds. September, 1900.

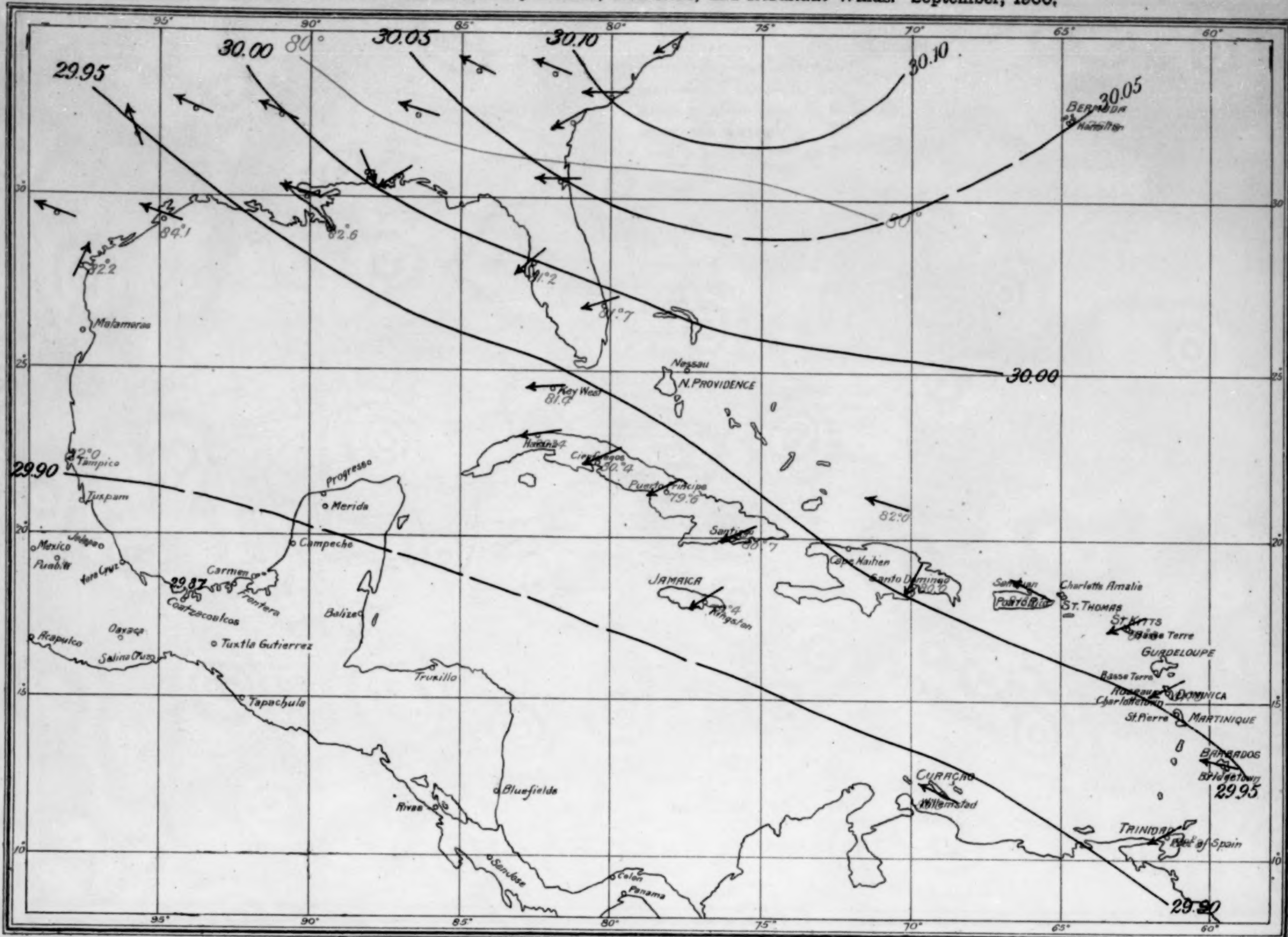

Chart IX. Galveston Hurricane. September 6, 1900, 8 A. M.

Chart X. Galveston Hurricane. September 7, 1900, 8 A. M.

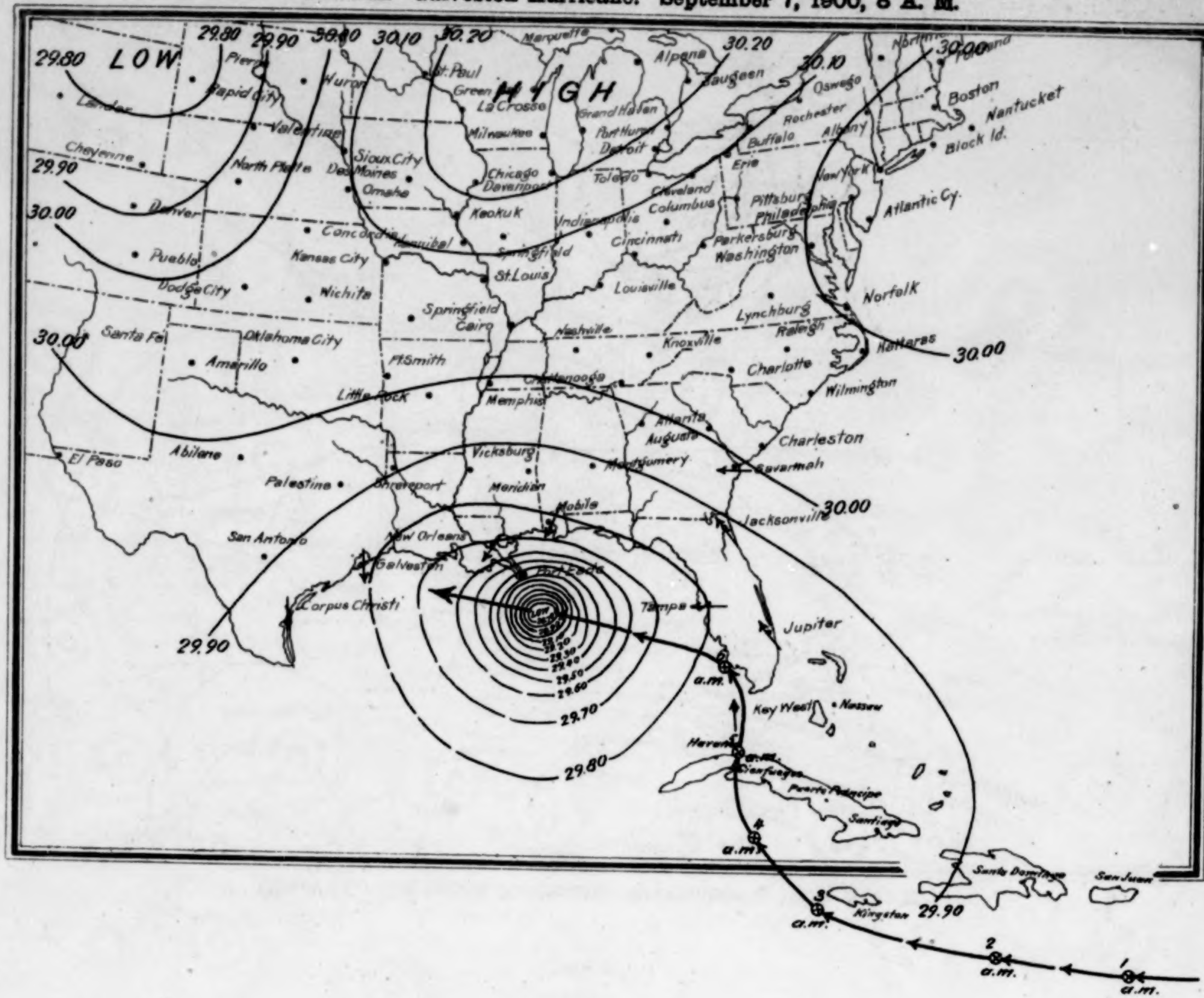

Chart XI. Galveston Hurricane. September 8, 1900, 8 A. M.

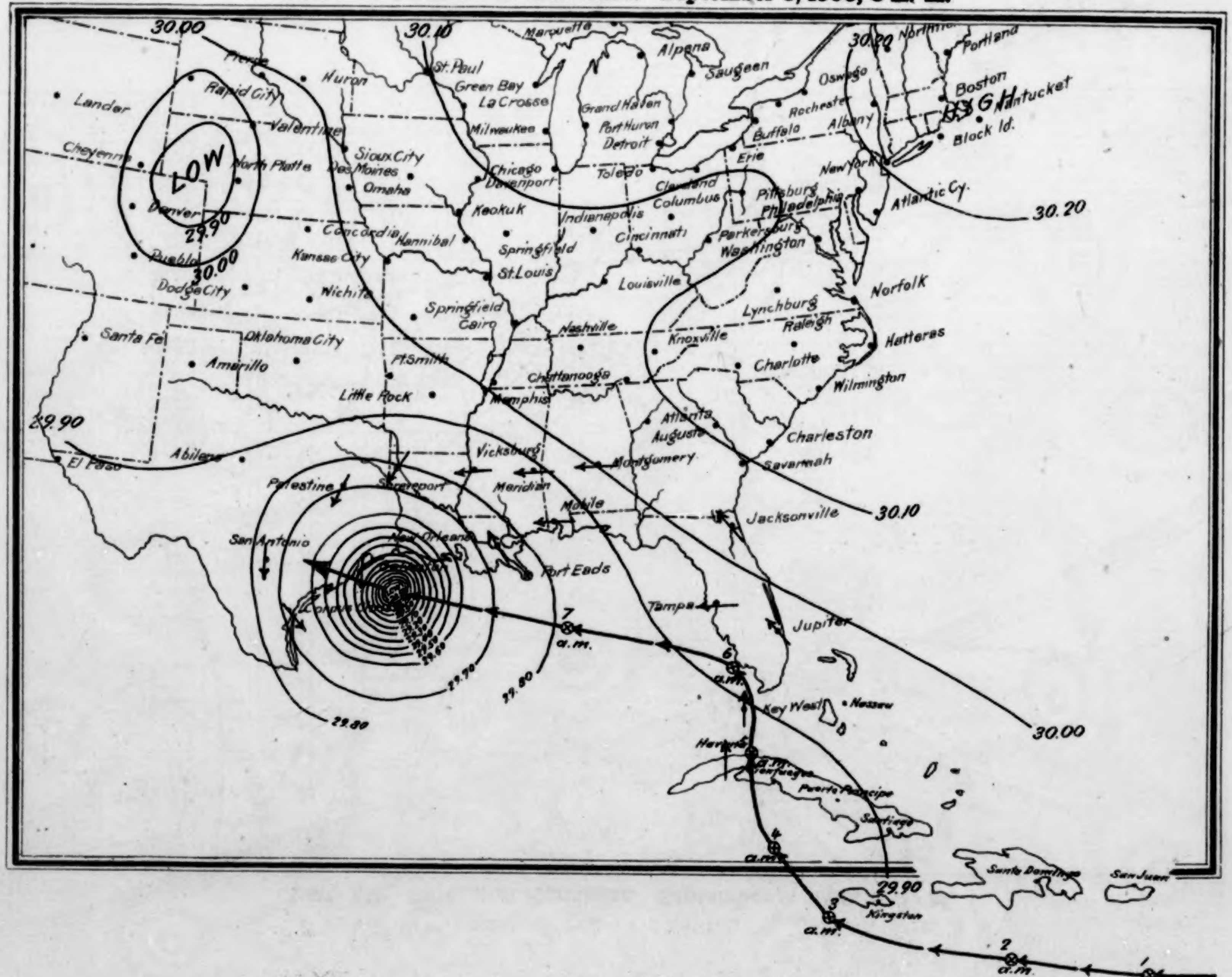

Chart XII. Galveston Hurricane. September 9, 1900, 8 A. M.

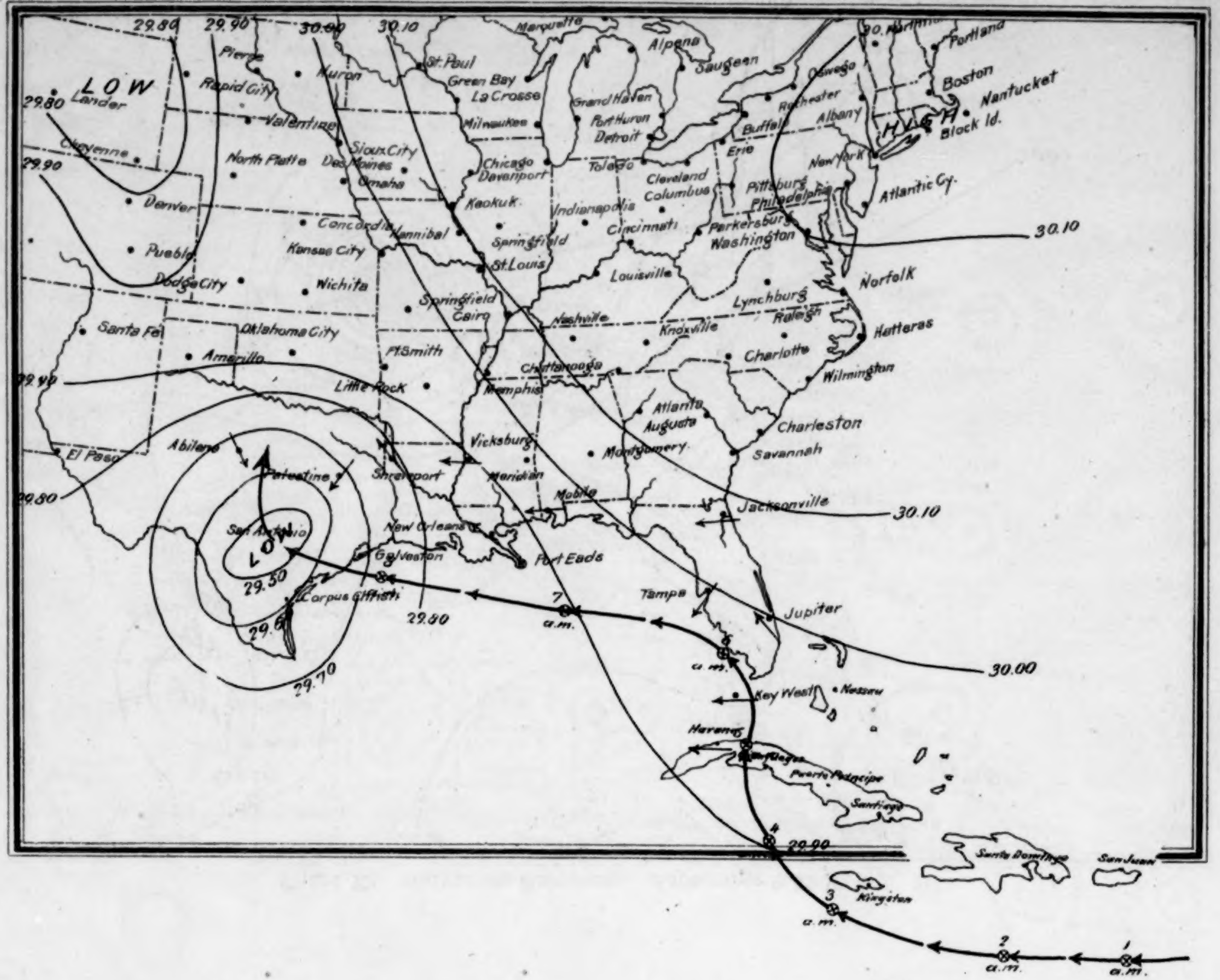

Chart XIII. Storm Swept District in Galveston.

Chart XIII. Storm Swept District in Galveston.